

BIRLA CENTRAL LIBRARY

PILANI (RAJASTHAN)

Call No. 636.5954-
T91P

Accession No. 13274

Acc. No

ISSUE LABEL

Not later than the latest date stamped below.

POULTRY-KEEPING IN INDIA

A SIMPLE AND PRACTICAL BOOK ON THEIR CARE AND
TREATMENT, THEIR VARIOUS BREEDS, AND THE
MEANS OF RENDERING THEM PROFITABLE

BY

ISA TWEED

ILLUSTRATED

FIFTH EDITION

Revised and brought up to date

CALCUTTA & SIMLA
THACKER, SPINK AND CO

1921

PRINTED BY
THACKER, SPINK AND CO.
CALCUTTA

PREFACE.

SINCE the first edition of this book was published poultry-breeding has become more popular in India, and the demand for pure bred and high class stock has greatly increased. My object in writing this little book has been to help people in India to understand that Poultry-keeping can be made both a pleasurable and a profitable undertaking, and that my efforts in that direction have been successful is proved by the large number of Europeans and Indians who are taking an interest in poultry-breeding.

In this the fifth edition I have made only such corrections and additions as I find, after further experience, to be necessary. I have had to state certain facts more than once in different parts of the book, in order to make the matter clear and emphasise their importance.

The illustrations herein given are of ideal birds of the different breeds, and should be the standards up to which all fanciers should endeavour to breed. It cannot be expected that every chicken hatched from eggs of even the most perfect birds will come up to the standard in all points, but even so, every breeder should aim at nothing short of perfection in size, shape and colour in all the birds he produces.

With a right knowledge of the breeds and proper methods of breeding and rearing, success is assured in a great measure.

Poultry-breeding has become very popular in England, America, Canada, Australia, and South Africa and in all the countries of Europe, where many people in the highest ranks of society have entered the arena, and are amongst the most successful breeders and exhibitors of both fancy and utility fowls. I trust the European and Anglo-Indian communities in India will take a still greater and more intelligent interest in poultry-breeding, and that this book will continue to be of help to them.

ISA TWEED.

1921.

THE following Papers are recommended to those wishing to keep in touch with matters concerning poultry-keeping. It should be remembered, however, that while those published out of India are quite reliable when describing poultry, their diseases and cures, yet climatic differences make their advice as to housing and feeding applicable only to those living in the hills of India.

Australian papers, and particularly the Queensland ones, are useful to dwellers in the plains.

INDIA.

Indian Fowl Fanciers' Journal. 300, Bowbazar Street, Calcutta.

Indian Poultry Gazette. Carlton Hotel, Lucknow, U. P.

ENGLAND.

Poultry. 10, Essex Street, Strand, London.

Poultry World. 154, Fleet Street, London.

Allen's Monthly Hints. Drury Lane, London.

Farm and Garden. 148, Aldersgate Street, London.

The Feathered World. 9, Arundel St., Strand, London.

AUSTRALIA.

Poultry Bulletin. 200, Castlereach Street, Sydney.

Australian Hen. 52, Margaret Street, Sydney.

AMERICA.

Poultry Fancier. Pennsylvania.

American Poultry Journal. New York.

Reliable Poultry Journal. Illinois.

Successful Poultry Journal. 537, South Dearborn St.,
Chicago, Illinois.

Farm Poultry. 39, Sudbury St., Boston, Mass.

CANADA.

Canadian Poultry Review. 184, Adelaide Street, Toronto.

LIST OF ILLUSTRATIONS.

	PAGE.
LIGHT BRAHMAS	<i>Frontispiece.</i>
FIGS. 2 AND 3. PLANS OF POULTRY HOUSES AND SHEDS	27
FIG. 4. POULTRY HOUSE	<i>facing</i> 28
„ 5. HOUSE	29
„ 6. LIGHT BRAHMAS, ENGLISH TYPE	39
„ 7. LIGHT BRAHMA COCK, AMERICAN TYPE	39
„ 8. LIGHT BRAHMA HEN, AMERICAN TYPE	54
„ 9. DARK BRAHMAS, ENGLISH TYPE	54
„ 10. DARK BRAHMAS, AMERICAN TYPE	60
„ 11. BUFF COCHINS, ENGLISH TYPE	64
„ 12. BUFF COCHINS, AMERICAN TYPE	64
„ 13. WHITE COCHINS	69
„ 14. BLACK LANGSHANS	72
„ 15. BUFF LANGSHANS	75
„ 16. WHITE LANGSHAN COCK	75
„ 17. BARRED PLYMOUTH ROCKS, ENGLISH TYPE	78
„ 18. BARRED PLYMOUTH ROCKS, AMERICAN TYPE	81
„ 19. CHITTAGONG OR MALAY FOWLS	86
„ 20. BUFF ORPINGTON COCK	86
„ 21. BLACK ORPINGTONS	89
„ 22. WHITE ORPINGTONS	89
„ 23. WHITE ORPINGTON COCK	90
„ 24. WHITE ORPINGTON HEN	93
„ 25. BUFF ORPINGTONS	94

	PAGE.
FIG. 26. SILVER-LACED WYANDOTTES	98
„ 27. SILVER-LACED WYANDOTTE COCK	98
„ 28. WHITE WYANDOTTES	100
„ 29. WHITE WYANDOTTE COCK	102
„ 30. GOLDEN-LACED WYANDOTTES	105
„ 31. WHITE HYDERABAD GAME COCK	107
„ 32. RHODE ISLAND RED HEN	108
„ 33. LIGHT SUSSEX	108
„ 34. RHODE ISLAND REDS	112
„ 35. MALINES	113
„ 36. FAVEROLLES	113
„ 37. BLACK-RED INDIAN GAME	116
„ 38. MOTTLED INDIAN GAME	116
„ 39. HOUDANS	125
„ 40. BLACK MINORCAS	128
„ 41. WHITE ROSE-COMB LEGHORNS	133
„ 42. BUFF LEGHORNS	138
„ 43. ROSE-COMB BROWN LEGHORNS	141
„ 44. SILVER-SPANGLED HAMBURGS	141
„ 45. CHINA SILKIES	146
„ 46. DORKINGS	146
„ 47. HYDERABAD BLACK-RED GAME	149
„ 48. WHITE INDIAN GAME, AMERICAN TYPE	152
„ 49. HYDERABAD GAME HEN	152
„ 50. PEDIGREE CHART	155
„ 51. TYPES OF COMBS	158
„ 52. METHOD OF TESTING FERTILITY OF EGGS	191
„ 53. HATCHING BOX	191
„ 54. BROODER AND RUN	199
„ 55. HOUSE AND RUN FOR CHICKENS	204
„ 56. COOP WITH COVERED RUN FOR CHICKENS	204

CONTENTS.

CHAPTER.	PAGE.
I.—PLEASURE AND PROFIT OF KEEPING AND BREEDING POULTRY ; THE FASCINATION OF POULTRY-BREED- ING, BEGIN IN A SMALL WAY ; WOMEN AND POUL- TRY-KEEPING	1
II.—THE GROUND SUITED FOR POULTRY-REARING :— Soil ; Shelter ; Shade	15
III.—FOWL-HOUSE, SHED AND YARD :— Space needed : The House ; The Shed ; The Yard ; Construction : Roof ; Ventilation ; Door ; Floor ; Perch ; Laying Nests ; Shed ; Dustbath ; Lime ; Yard ; Light ; Water-vessels ; Trap-door ; Box- house ; Cleanliness ; Rats ; Snakes	17
IV.—FOOD :— Quality of Food ; Change of Food ; Quantity of Food ; Frequency and Regularity of Feeding ; Preparation of Food and Mode of Feeding ; Water ; Lime ; Sharp Grit ; Care of Cock Birds ; Cost of Food ; Housing ; Feeding	30
V.—THE SELECTION OF BREEDS :— Object in keeping Poultry ; Delicate Breeds ; The best Layers ; The largest and most weighty Birds ; The most hardy Birds ; The best Table- fowls ; Eggs ; Non-sitters ; The best Sitters and Mothers ; The best Breeds to keep ; Other Indian Breeds ; A Profitable Method ; The best Crosses ; The way to improve the common	

CHAPTER.	PAGE.
country fowl; Poultry-breeding in India; Number of Breeds to keep; Advantages of a single Breed; Poultry for the table; Egg Production	44
VI.—THE DIFFERENT BREEDS OF FOWLS:—	
Brahma; Cochín; Langshan; Rock; Wyandotte; Houdan; Malay or Chittagong; Aseel or Game; Ghagus; Orpington; Silkie; Dorking; Minorca; Campines; Hamburg; Leghorn; Ancona; Sussex; Rhode Island Red; Faverolle; Malines; Imported Poultry; The best Breed; Size; Buying Eggs and Fowls; Pure-bred or Cross-bred; Egg-production and Fertility ..	71
VII.—BREEDING:—	
The Art of Breeding; The Parent's Influence; Stock Birds; Proportion between Cocks and Hens; Number of Hens to each Cock; How to manage Cockerels; Kept separate; The Colony Plan; Mating for Colour; Cross-breeding; Crowding; Care and Feed; How to know the best Layers; How to know the age of Birds; Fat Hens; Selection of Breeding Stock; The Influence of the Male Bird; The Egg Type ..	124
VIII.—EGGS AND HATCHING:—	
✓ When Hens lay; The best time to set Hens; Selection of Eggs; Selection of the Mothers; Purchasing Cluck Hens; The Nest; How to treat the Sitting-hens; How to treat the Eggs; Num- ber of Eggs under a Hen; How to keep Eggs; How to treat Eggs which have travelled; Put- ting the Hen off the Cluck; How to Pack Eggs; Purchasing Eggs; To buy Eggs or Birds; The Faithful Hen; Eggs for Setting; Day-old	

CHAPTER.	PAGE.
Chickens ; Breeds and Utility ; Purchasing Fowls	157
IX.—REARING CHICKENS :—	
✓ Treatment of Chickens ; The First Feed ; How often to feed them ; What to feed Chickens on ; Water ; Green Food ; Animal Food ; Grit ; Mixture of Food ; Colour of Chickens ; Neglect ; Clipping Wings ; Examine the Vent ; Over-feeding ; Brooder and Run ; The Run ; Shade ; Crows and Kites ; At Night ; Kept separate ; Injurious Practices ; Ground ; Cleanliness ; Vermin ; Wet and Damp ; Perches ; Coops and Houses ; Weeding out the Stock ; Things you ought to Know	188
X.—ARTIFICIAL HATCHING AND REARING BY HAND ; BOX FOSTER-MOTHER	209
XI.—MANAGEMENT OF LARGER CHICKENS ; CAPONING ; MANURE ; FATTENING FOWLS	217
XII.—THE INFLUENCE OF CLIMATE ON DOMESTIC FOWLS ..	224
XIII.—DISEASES OF POULTRY	234
RECIPES	274

POULTRY-KEEPING IN INDIA.

CHAPTER I.

PLEASURE AND PROFIT OF KEEPING AND BREEDING POULTRY.

POULTRY-KEEPING is a source of pleasure to those who have the means to keep them properly and the time to give them personal attention. Apart from the pleasure derived from poultry-keeping, it is a proved fact that poultry-breeding is profitable in India. It is surprising that greater time and care have not been given to this important industry. At present the breeding and rearing of poultry is still almost entirely in the hands of the low-caste poor and ignorant natives, who allow the birds to live and grow anyhow, and are satisfied if they procure a few pice for a *moorgi*. There is no need to try and compete with these people. The fowls they rear are very small and sell for very small prices. But there is no fear of over-stocking the market in this country. There is a growing demand for a larger and better class of poultry for the table, and they who supply this demand are sure to find it profitable.

There is no more delicious and delicate meat than that of a well-fattened fowl. Who does not enjoy the luxury of a large new-laid egg, or a fine fat tender fowl? While many enjoy these luxuries, there are few who are willing to give a little time and care to procuring them. Some small souls imagine that poultry-rearing is degrading to their imaginary greatness, and look upon it as beneath their dignity. Nothing that is honest and useful is in itself degrading. If a person is ashamed to rear fowls he ought to be ashamed to eat them.

We could not only point to high-born ladies who do not think it beneath them to attend to their own fowls, but can aver that even the most menial offices may be performed in any properly constructed fowl-house without so much as soiling the fingers.

Any person who has a small back-yard can conveniently and profitably keep a few fowls, but those who live in the suburbs of towns, and in the mofussil, have all the necessary advantages for poultry-rearing.

Missionaries and missionary-societies should give their attention to poultry-breeding and employ their Native Christians to work the farms. It is more Christian and really missionary work to employ and train some of the Christians to earn an honest and good living by breeding poultry than to allow them to live idle and useless lives and be a burden to the mission and a disgrace to the Church, as many are to-day. Why is it any less right and proper for missionaries to work and supervise poultry-farms for the benefit of the people

they are trying to save and elevate to a higher moral and intellectual level than it is for them to run schools, carpenters', shoe-makers' or blacksmiths' shops, or printing presses or weaving factories ?

There are a great many Europeans, Eurasians, and Indian Christians in India who have small incomes and find it difficult to maintain their large families. Now, to such persons poultry-breeding and rearing can be a source of profit, and be made to contribute towards the maintenance of the family. In a family where there are some children of twelve or more years of age, there need be no lack of help in taking care of the poultry. One person can look after the feeding of the fowls, another look after the chickens, another see to the cleaning of the house, and thus assist the parents to add a little to their small income. The parents should supervise and direct the operations, but the management must never be left entirely in the hands of the uninstructed and inexperienced young people. If a person be unable or unwilling to give a little of his time and attention to his poultry, he had far better not engage in poultry-keeping at all.

Some persons have tried their hand at poultry-breeding and rearing and failed. They have failed, not because the thing was impracticable or unprofitable, but because they did not comply with the conditions upon which success is assured. They failed because they did not know how to manage the business, or because they left everything to servants ; failure was the fruit of their ignorance and neglect.

To assure success one must know how to manage poultry, and must see to everything himself and not trust servants.

A man I knew made up his mind to breed and rear poultry, so he went to the nearest bazaar and bought twenty hens and a cock. The hens were the commonest obtainable; some were very old and some sickly. He made a small enclosure 10×10 feet for them and fussed about for a few weeks. The hens laid very few eggs, some died, others were drooping, and at the end of three months he was left with only four or five fowls. After this sad experience the poor fellow felt himself qualified to pronounce poultry-keeping an impossible task for Europeans in India.

A lady procured six handsome Cochin fowls and kept them in a small, dark, damp room and an enclosure about 3×6 feet, and ordered the *mehter* to feed the *belatee moorgi* on “*dan* and *bat*.” In a few weeks the poor birds sickened and died. This good sister was convinced that “India is no place to keep fowls, for they die every year in the rains.”

India is no worse than any other place in the world for breeding fowls. The trouble is not with the country so much as with the stupidity and laziness of the people who try to rear them. Lazy people will never succeed in breeding poultry. One must work and work faithfully if he will succeed. There is no luck in this business; it is all work. Poultry-keeping and breeding is always a pleasurable and profitable occupation to those who try to make it so.

I would advise anyone who intends to begin poultry-keeping to keep only one breed, and commence by keeping

only one cock and four or six hens of that breed. He should procure a copy of this book and carefully study it in every detail. He should also take in one or two first class poultry papers. Several very good ones are published in England, America, Australia, Africa, and India. "The Indian Fowl Fancier's Journal" and "Indian Poultry Gazette" are specially valuable. As his knowledge and experience in poultry-breeding increases, his poultry-yard should be gradually extended, and in a couple of years he will have a properly stocked and well-managed poultry-yard.

One reason why people fail in poultry-breeding is that they keep too many varieties and too many birds of each breed. A person should keep to one breed and study the characteristics of that breed thoroughly and try and get his stock up to as near the standard of perfection as possible. When he has done this, he may take up a second breed and work with it as he did with the first one. In this way he will in a few years be a master of the art of successful poultry-breeding, and find real pleasure and profit in it.

There is always a good market for poultry. First-class breeding stock will sell for from twenty-five rupees to fifty rupees a trio—a cock and two hens; imported birds will cost very much more. Fowls for the table will sell—large ones from one rupee to three rupees each, medium-sized ones from eight to twelve annas, and small ones, for stew and curry, from three to six annas each. The small village *moorgies* sell for half of the above-mentioned prices.

Eggs for breeding stock will sell for from three to six rupees a dozen; and eggs for the table will sell for six to twelve annas a dozen.

THE FASCINATION OF POULTRY-BREEDING.—There is a strong fascination in breeding poultry. Men of all classes pursue it with unbounded enthusiasm, sometimes even to the neglect of other and more important matters. Princesses, countesses, princes, dukes, earls, judges, lawyers, doctors, clergymen, teachers, business-men and mechanics—all are numbered in the ranks of poultry-breeders. Many of them are unknown to the professional breeders, but they follow their pursuit for their own gratification. They do not exhibit; they do not sell fowls. They keep them for the pleasure they find in them. If there were not a fascination in breeding poultry, these non-professional breeders would not be poultry-keepers.

There are, it is true, quite a number of persons who keep poultry for the fresh eggs they yield and for the chickens which are used upon their tables, but there are many others who do not have a thought about the profits of poultry-keeping and who, through expensive methods, do not make any profit but yet continue to keep them.

What is the secret of this fascination?

One of the secrets—for I believe the fascination results from several causes—is undoubtedly the beauty of the fowls. Any breed, even the plainest, is beautiful. Where the fowls are healthy and in full plumage, showing by their actions that they enjoy life, beauty is not wanting. While

certain breeds, among which are the Brahma, the Cochin, the Langshan, the Plymouth Rock, the Orpington, and the Wyandotte, are generally deemed to be especially ornamental; a well-bred specimen of any other breed is not to be excluded from this class. And as tastes differ, what is ornamental in the eyes of some is far from ornamental in the eyes of others. A well-bred Barred Plymouth Rock, for example, is to me a beautiful fowl, and yet I have known men who thought—and I have even seen it stated in print—that by no stretch of the imagination could this breed be deemed to possess any beauty. Cochin breeders are among the keenest of fanciers; to them the beau-ideal of fowls is the massive Cochin, and yet there are men whose souls are so dead that they can see in the Cochin only a clumsy mop of feathers devoid of any semblance of beauty. I have heard even the exquisite Indian Game called an ugly thing, and the beautiful Malay and Chittagong an ungainly crow comparable to a pair of tongs. But every breed has its admirers, and to them that breed is the incarnation of beauty.

Another of the secrets of this fascination is to be found in the love for living things. A child loves its doll, but if it is given a kitten or a puppy, something that is alive, it quickly transfers its affection to the living creature. And men are after all but grown-up children, and this feeling survives in the adult. We never outgrow it; we may change somewhat the object of our affection, but the love for living things abides. In the life of the poultry-yard, from the little ball of down with beady eyes which emerges from

the egg to the fully-developed and furnished fowl, pleasure is found. The ways of these feathered dependants, the courage and gallantry of the cocks, the motherly instincts of the hens, the imitative manners of the chickens, aping their elders as the boy apes the man, afford a pure and healthful pleasure. The varied language of the poultry-yard is a study in itself, and one can see how delightful an essay may be written on it by reading Gilbert White's *Natural History of Selborne*. And then, too, the growth of the chicken from the time it is hatching until it assumes the *toga virilis*, the varying changes, in size, shape and coloration, afford a perennial charm. Out of a study of all these things the philosophic mind draws many a valuable lesson and learns to apply it to the conduct of human life.

And still another of the secrets of this fascination, which has the stronger hold upon the more intellectual breeders, is the opportunity to study the laws of life. The great problems of biology are helped in their solution by the student who breeds poultry. The beginning and progress of life in the egg, the relation of growth to food and other elements, the laws of variation and heredity, the effects of inbreeding and outbreeding, all find illustration in this pursuit. And the origin of the different breeds, whether derived from some common ancestor, or whether they are the descendants of several or many special creations,—a study which has bearings upon some of the most profound scientific hypotheses, and which more or less determines the philosophy of the student,—can be studied to great advantage in the

poultry-yard. Indeed, it is not extravagant to say that there are few, if any, better fields for such investigations, and the more thoughtful and observant of breeders are almost necessarily led into the consideration of these great questions. And some of these questions intrude themselves upon the attention of every breeder, even the least thoughtful and observant, for his breeding operations cannot be carried on successfully without at least a superficial knowledge of some of them. And it so happens that every breeder must in some slight degree be a student of biology in some of its branches, and that in becoming such a student he finds an intellectual growth. *Intellectual growth* necessarily means pleasure, and this pleasure adds to the fascination of his pursuits. And the beauty of it all is that, unlike so much human knowledge, this knowledge comes by a royal and easy road, without the birth-pangs of many of our attainments. There are no burnings of the midnight oil, no aches of the weary brain, but only the simple joy of outdoor observation.

But the greatest of the secrets of this fascination consists in the power that man finds himself able to exercise over these lives in moulding them to his will. This one cause alone would be an ample explanation of the fascination of poultry-breeding. Fowls possess a constitution of wonderful plasticity. As the variations appear from year to year in breeds, either through the natural tendency to vary or through that tendency multiplied by the matings made by man, the breeder seizes upon such as suit his purposes, and thus modifies, improves,

changes and transforms the diverse characteristics of his flocks as his aim and purpose may be. Old breeds are improved, new breeds are created. Man is here exercising a power that seems to him to be somewhat akin, however far removed in degree, to the creative power of his Maker. And the exercise of his power gives him a sense of his greatness as compared with the lower orders of creation, which produces a wonderful complacency in his mind.

Such are some of the causes which help to explain the great fascination of poultry-breeding,—a fascination which seems never to lose its power over the man who has once fallen under its influence. Circumstances may compel him to give up breeding fowls, but the contemplation of their charms, the study of the laws of life, and the admiration for the work of the most skilful breeders remain. These are a present possession that nothing can divest him of. In sickness or health, in poverty or wealth, amid the cares of a busy life, shut in by brick and stone walls, where fowls are never seen, he still can enjoy the remembrance of the fowls he has bred and the knowledge he has attained.

BEGIN IN A SMALL WAY.—Success or failure with poultry depends upon the poultryman himself. There are good opportunities of making money with poultry, and many ways of saving money by judicious arrangements and close attention in the keeping of fowls; but for a beginner to suppose that because he is provided with a certain amount of money and can secure a likely-looking place for business success is certain, is a mistake that may result

in disappointment. Although at first matters may seem easy, the undertaking may sooner or later end in a very sad awakening to the reality of the dead loss. But if the business could be made an adjunct to something else that does pay, then, with acquired knowledge gained only by experience and unremitting attention to the smallest details, it may be made to add very materially to the annual receipts, and later on may be made an exclusive business. Very great mistakes are often made in attempting too much at first, by keeping too many varieties ; it is, therefore, best to absolutely decide which one of the breeds in the market will be best in the situation selected, and keep and breed nothing else. Learn at first, be willing to do any kind of work, and experience will bring success. Poultry-keeping will pay if one will begin with a few and increase every year.

WOMEN AND POULTRY-KEEPING.—Among all my friends and acquaintances who keep fowls for family use there are very few from whom I do not hear frequent complaints of large consumption of food and small production of eggs—very great expense and very little return ; and I think this absence of success mainly arises from the fowls not receiving the small amount of care and attention which is absolutely necessary to produce good results. In many families where small livestock are kept only, the care of them devolves on the servants, or—to word it more correctly, perhaps, I might as well say—on nobody. Now, I wish to see this pleasant, healthful, and certainly not unladylike branch of domestic economy attended to—carefully attended to—by the old and young ladies and

little girls of families in the middle and higher ranks of society. I am quite sure my pretty countrywomen (and that they *are* pretty is confessed by every foreigner who speaks upon the subject) would find it conducive to health, activity, and cheerfulness, to be thus led out into the fresh morning air for half-an-hour or a little more every day of the year, and with such attention the poultry of our land would not, I hope, so often receive, with justice, the ungrateful character of giving no return to those whose food they eat. Nor is this closely watching nature in her living children less healthful to mind than to body. Our ladies have many less innocent and less improving, as well as less healthy, employments. Even the language of the hen-yard is interesting to the observant lover of nature. The vocabulary of a vigilant, affectionate, gallant cock is as expressive as it is diversified. Who can possibly misunderstand the sharp, shrill cry with which he recognises any unusual sight or sound and warns his companions of the approach of danger? The low, affectionate cooing with which he greets his favourite hens, the melancholy cadence of his crow if separated from them, his friendly call to them at feeding time, and his more energetic summons on finding some morsel particularly nice to offer them, are all as unmistakable as the plainest English. Nor are the hens behind their lords in conversational powers. When an egg is likely to be laid, a peculiar uneasy, complaining sound gives warning; when it is produced, they sing a song of triumph; when they desire

to sit, another note makes their wishes known, which note undergoes an evident change when the sitter first hears the chirrup of the chicken within the egg-shell. Some little time before this sound is perceptible to less interested listeners, and when she leads her chickens forth, there is no end to her talk and its varieties. Surely these creatures, so peculiar in their habits as to be often referred to in God's Holy Word, are not beneath our notice and the notice of the intelligent, simple-minded, home-loving women of India? I think it is shrewd old William Cobbett who remarks the improvement to the character of cottagers' children which is likely to arise from the care of animals and the kindness and fondness which they are sure to feel towards their favourites; now I am of opinion that it is not only cottagers' children who may, in the care of poultry, receive useful lessons in patience, good humour and the love of order. If fowls are not noticed and treated with patient kindness, they will never display the tractable tameness which so much diminishes the trouble of taking charge of them, especially when sitting and rearing chickens, and without order and cleanliness in all the arrangements they will neither be happy nor healthy, handsome nor productive. The time occupied need not be considerable, particularly when we come to consider, on the one hand, the benefit to health from this out-of-door exercise, and, on the other hand, that the feeding may at any time be temporarily confided, always under guidance, to a lad or young girl who is trustworthy. Half-an-hour before *chota hazri* to let out the

poultry and spread their food, a few minutes at noon, and half-an-hour towards evening to feed again, and see them counted and safe to roost—this is all the time which need be occupied for nine months in the year. During December, January, February, March, and April the sitters and the mother hens and their young broods require rather earlier attention, more frequent feeding, and a little more care.

Neither is it in many families a circumstance to be entirely overlooked that this may be a cheap amusement. True, those who delight in choice and handsome creatures may indulge their fancy by rearing fancy fowls; but the soft tender downiness of the twittering little chicks and the pleasure of watching their development, like the fresh innocent beauty of young children, is not confined to any race, and common cocks and hens are not expensive. In thus recommending that the care of the poultry should be confided to the ladies, especially the younger members of families, I would not, of course, be understood to wish that those who from their stations in life are expected to be educated and refined should busy themselves in their hen-houses with shovel and broom and neglect their education; but what I wish to advocate is that where the well-being and comfort of live creatures are at stake they should become the charge of one member of the family,—one both willing and able to attend to their comfort, to see to their feeding, to direct the necessary degree of cleanliness and in all things to take care that they receive their regular care and attention and kind treatment so absolutely necessary to produce success.

CHAPTER II.

THE GROUND SUITED FOR POULTRY-REARING.

SOIL.—Poultry can be kept with varied success all over India, but any portion of the country where the soil is sandy, gravelly, and abounding in *kunkar*, with a good proportion of lime or chalk in it, and with a natural drainage, is admirably adapted to the rearing of fowls, especially so where the rainfall is not excessive. The more elevated, porous, and well-drained the soil is, the better. The heavier the soil is, and the more it retains moisture, the worse will it be for the fowls that have to stay on it. Marshy, dirty or badly-drained grounds are fatal to fowls. The side of a hill with a south or south-east aspect makes an ideal poultry-run.

SHELTER.—Poultry must be sheltered from the sharp cold north and east winds, and from heavy rain. If they are allowed to walk about in water and puddle, or be chilled by the cold winds, they will not thrive. During the cold weather and rains the north of the shed must be kept closed, and movable screens put up on the west and east to protect from the cold and rain at night.

SHADE.—Poultry need to be protected from the midday sun, and the hot winds during the hot season. There should be a shed and a number of large shrubs and trees for

shade to protect the fowls from the heat. During the hot weather the west side of the house and shed should be closed during the day and opened at night. The south and east are the coolest during the hot season, and should be kept open. A large number of birds are killed by the heat. Unless sufficient shade is provided for the birds, they will suffer and die.

The best trees for shade are the Mango, Jack, Nim, Lime, Pumalo, Lichee, Star-apple, Rose-apple, and Jamon. Where there are no trees, some should be planted immediately. The Mango grafts, Lichee, and Jack should be planted thirty feet apart. The Pumalo, Lime, and Nim should be planted only fifteen feet apart. I have found it is a good plan to plant clumps of *Hibiscus* or Plantain, four feet apart, on the four sides of the yard. On the hills there should be trees enough to give shelter to the birds. The bare side of the hill is most unsuitable for poultry.

Until the trees and shrubs grow sufficiently large to afford enough shade, some other plan must be adopted to provide shade for the birds. A shed, from ten to fifteen feet square, made of bamboo and straw, and raised on bamboo posts three feet from the ground, should be made in a convenient and high part of the run. The posts should be put a foot-and-a-half into the ground, and there should be a good thick layer of straw on the shed. This shed is best placed on the east of the poultry-house. The ground under the shed should be raised and properly drained. In a large run a number of small sheds should be made.

CHAPTER III.

FOWL-HOUSE, SHED AND YARD.

SPACE.—Fowls will not thrive if kept in close confinement. The more space allowed them, the better. Close confinement and overcrowding are fatal to poultry.

The House.—One hundred and fifty cubic feet of space, or a place five feet long, five feet wide and six feet high, is necessary for every five large birds. Some persons would crowd twenty fowls into this small space, but in doing so they will sacrifice the health and happiness of the birds and hinder the production of eggs.

The Shed.—There ought always to be an open shed or verandah attached to the fowl-house to serve as shelter for the birds from rain and the midday sun. The shed should be, if possible, as wide and twice as long as the house, but if it be the same size as the house, it will suffice.

The Yard.—A run twenty-five feet wide and fifty feet long is the minimum space needed for one cock and four hens; the greater the space allowed, the better. I prefer to give a run fifty feet wide and one hundred feet long to each pen consisting of one cock and four to ten hens. Fowls will not thrive or lay well if confined in small runs or crowded together. The least amount of room allowed each

fowl in a yard should be twenty-five feet long by ten feet wide, or two hundred and fifty square feet. Never try to give less ; give four times the ground if possible.

CONSTRUCTION.—The fowl-house must be built of either brick, wood or mud walls. If of brick or mud, it must be made smooth and whitewashed with lime both inside and out ; if of wood, the interior must be painted with a mixture of seven parts kerosene oil and one part tar, and the outside painted first with kerosene oil and then with white paint or whitewashed with lime. Never put tar to the top or outside of a wooden house ; it will make the house terribly hot.

A serious objection to mud walls is that they are convenient for rats to make holes in, and for snakes to lodge in.

The house ought always to open to the south. During cold nights the house should be closed on the north, east and west, opening only on the south, but during the hot weather and rains the west and east should be kept open also.

The size of the house will, of course, depend on the number of fowls to be kept. But it is advisable to have several small houses rather than one large one, as in case of an epidemic breaking out, the only chance of saving at least part of the stock is to be able to prevent any communication between the different sets of birds. No house should be more than twenty feet long and six feet wide or ten feet by twelve feet. This will hold twenty fowls.

Roof.—The roof of the house may be made of either *pucca* work, thatch or wood, but never of corrugated iron or tin. There should be no open space between the roof

and walls for cats, rats or snakes to get in by. If corrugated iron be used for roofing, a good layer of thatch or mortar must be put over it or wood under it.

Ventilation.—If built of brick or mud the south side of the house ought to be enclosed with half-inch mesh wire-netting; on the north, east and west, high up near the roof, there should be some openings, twelve inches by six inches, covered with the same kind of wire-netting. This will afford perfect ventilation at all seasons, and the house will not be too warm in the hot, or too cold in the cold, season.

Door.—The door of the house ought to be on the south, and made of a wooden frame covered with half-inch mesh wire-netting. The size of the door should be in proportion to the house, but always large enough to allow a man to conveniently get through.

Floor.—The floor of the house ought always to be *pucca*, well beaten down and plastered or cemented. On the floor there should be coarse sand or dry earth put at least three inches deep. Phenyle or kerosene oil should be frequently sprinkled on the sand and earth. The droppings on the sand must be removed every morning, and the sand changed every three weeks or a month. During the cold weather straw may be used on the floor, but straw helps to breed vermin. Before being used it should be steeped in phenyle and water and well dried. It must be frequently changed.

Perch.—Inside of the house, eighteen inches from the wall, running parallel to the walls, there should be perches twelve or eighteen inches from the ground. The perches

should be made of good strong wood, three inches in width, rounded off at the edges. Instead of a perch it would be better to put a thick layer of sand on the floor—six inches deep—for the birds to rest on.

Laying Nests.—Earthen *gumlas*, eighteen inches in diameter and nine inches deep, should be placed in the corners of the house for the hens to lay in. One *gumla* will do for three hens. Dry ashes, sand or sifted earth should be put six inches deep in the *gumla*. Unless laying nests are provided, the hens will lay on the ground or in some place where the eggs are apt to get broken or be stolen. By using a *gumla* and ashes instead of a box and straw you will prevent vermin. Put some flower of sulphur or tobacco leaf-stock with the ashes.

Shed.—During the rains fowls will not thrive if they are confined entirely to the house or allowed to constantly walk about in the wet and damp. A shed must be attached to the house; the east and west sides closed up with wire-netting, the north leading into the house, and the south enclosed with wire-netting and a door in the centre.

If desired, the shed may be placed to the east or west in a line with the house. The roof of the shed should be either *pucca*, wood or thatch, attached to the house and sloped down to the south or west. The floor of the shed may be plain mud, covered over with a good three inches of fine gravel or broken bricks and old plastering. The door of the shed on the south ought to open into the yard.

The gravel on the shed floor must be changed every month or two, and the earth dug up a foot or two deep and turned over once in six months.

Dust bath.—A *gumla* or a hole in the ground, two feet in diameter, should be filled with dry, clean, sifted earth or ashes and placed in the shed on the east side. This *gumla* should be continually refilled. Flower of sulphur should be added to the ashes. Coal ashes or cowdung cake ashes should be used.

Lime.—A small *gumla* filled with broken old sand plastering, old lime and mortar, or pounded bricks, slaked lime and flint grit, should be placed in the shed on the west side.

Yard.—The yard should be enclosed with one-and-a-half or two-inch mesh wire-netting. The height of the fencing will depend upon the size and breed of the fowls. The Brahma, Langshan, Plymouth Rock, Orpington and Cochin will need fences only four feet high; Game, Wyandotte and Chittagong six feet high; and smaller breeds, from six to ten feet. It is preferable to make the fence only six feet high and cover the top of the enclosure with two-inch mesh wire-netting. There ought to be plenty of green grass on the yard. Every six months at least half the ground in the yard must be properly dug up and turned over, and some kind of grain, such as wheat, mustard, sunflower, etc., sown on it. The best time to dig up the yard is after the rains. If done before the rains, the ground must be well raised and properly beaten down, or else it will become soft and retain water. Do not disturb the

soil during the rains. When only one breed is kept, and there is a wall or fence round the compound of the house, there is no need for an enclosed run; the fowls may be allowed the freedom of the compound. Fowls thrive well and lay better when allowed a free and large range. Hens allowed perfect liberty lay more eggs than do hens confined in small runs. The eggs of fowls on free range hatch better than do eggs of fowls confined in small runs. These facts should always be borne in mind when making a poultry-yard.

If the soil in the yard is unsuitable for poultry, the following method must be adopted to improve it:—Dig out the ground about six inches deep and throw twelve inches deep of sand, *kunkar*, old mortar and plastering and lime over the earth, mix properly, beat down and level so that no water can lodge on it. Coal ashes are very good to put down on the ground. It should be mixed with the *kunkar* and plastering. The ground must be properly rolled and grass allowed to grow on it. Fowls will thrive in such a yard if it is properly drained.

Some people allow decayed vegetable matter, and cow-dung, horse-dung, etc., to remain in the poultry-yard. Dirt and filth of any kind are a fruitful source of disease, and will work havoc among the poultry. No decomposed matter or excrements of any kind should be allowed to remain where the poultry are.

Light.—Light is just as essential to the well-being of poultry as is fresh air. The fowl-house must never be

built in a dark, gloomy corner, or on the north or east side of another building, or directly under trees. Plenty of sunshine is absolutely necessary ; without it fowls will take cold and become mopish, and die.

Water-vessels.—A vessel with clean and fresh water ought to be placed in the yard near the shed door. Always keep the water in the shade. If allowed to remain in the sun, it will become hot and will prove injurious to the birds.

Trap-door.—A small trap-door, twelve inches high and ten inches wide, should be attached to the door of the fowl-house. The door must be kept locked, but the trap-door must be left open during the day to allow the hens access to the laying nests. The door of the shed opening into the yard should be kept partly open during the day when the weather is fair. One has to guard against servants and crows, and also dogs and rats, stealing eggs from the nest.

Box-House.—Some people, who have not the means or room to make a proper fowl-house, keep fowls successfully in the following manner :—A box is made six feet long, three feet wide and four feet deep, enclosed on four sides with board ; the top and front are enclosed with half-inch mesh wire-netting. The top is a cover on hinges and lifts like that of a trunk, and is secured with a lock and key. On the front side of the box there is a door about a foot square, made of wooden frame and wire-netting, to let the birds in and out. In the centre, six inches from the bottom, a perch is run the whole length of the box. This box is placed

in a shed, or back verandah. It holds a cock and four to six hens, and is quite safe from cats, rats and jackals.

This box must be kept very clean, and have a good layer of sand or earth on the wooden bottom. It must be swept every day, and the box and perch frequently painted with a mixture of kerosene oil and tar.

The fowls are kept in the box at night and let out in the compound or yard during the day. An earthen *gumla*, filled with ashes, is placed in one corner of the box during the day for the birds to lay in, and the small door is kept open to allow them to get in.

CLEANLINESS.—Cleanliness is an absolute necessity. The house and shed must be swept every day, and every particle of the droppings removed. The yard, also, must be kept thoroughly clean, and nothing offensive allowed to remain.

The water-vessels must be thoroughly scrubbed every day, and the water changed twice a day.

At all seasons of the year, but especially during the rains, vermin breed rapidly in a fowl-house. The *gumlas*, perches and all the woodwork must be frequently cleaned and painted over with a mixture of kerosene oil and tar, or washed with a strong solution of phenyle.

The sand on the floor of the house and the gravel on the shed-floor must be changed as directed above. The ground in the shed and yard must be dug up and turned over twice a year.

The food and water must be good and clean.

The walls inside of the house and shed must be painted with kerosene oil or whitewashed with quicklime and carbolic acid every two or three months.

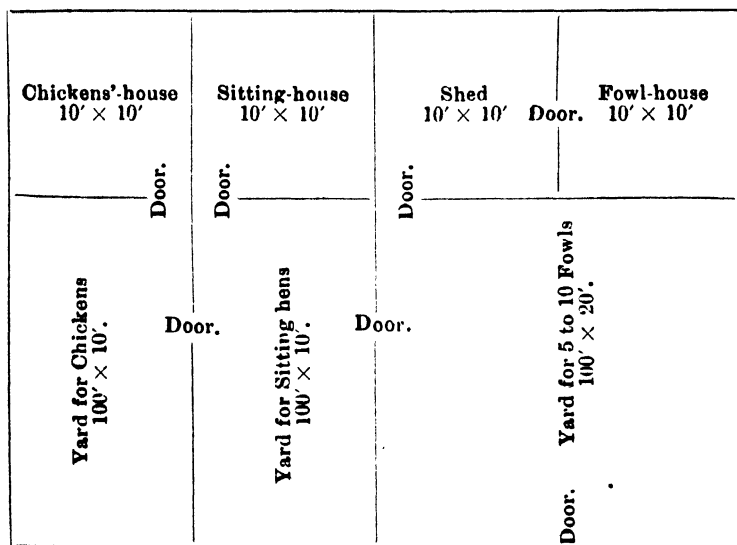
RATS.—Rats are a great nuisance in a fowl-house. If they are allowed to get into the house, they will cause irreparable damage. I have known rats to steal eggs and chickens, and kill fowls four and six months old. Besides that, they carry disease into a fowl-house. If the walls and flooring of the house be made of good *pucca* bricks and concrete, the rats will not give much trouble, but there is no way of keeping them out of a house made of mud or mats, unless the following plan be adopted :—Lay down half-inch mesh wire-netting on the floor, and run the wire-netting up the sides of the wall for about three feet. Over the wire-netting on the floor place four inches of dry sifted earth or sand, and put some cowdung and earth-plaster over the wire-netting on the sides of the wall. Corrugated-iron sheets may be used instead of wire-netting. By this means rats can be most effectually kept out of the house.

Another good way of making a rat-proof flooring is this : dig up the earth to a depth of twelve inches, remove all the earth and fill in the space to a depth of six inches with sand or coal cinders, pour in a lot of water and ram it down, over the sand or cinders put broken stone or rock and mix with pitch or asphalt, and ram down until you get a firm smooth surface. No rat will get through this. The stone or rock should be broken into pieces not larger than two-and-a-half inches in diameter.

It is no use trying to get rid of rats by poisoning them. The fowls will get at the poisoned food or dead rats and insects, and die from the effects. The best thing is to catch the rats in traps and give them to the terrier or drown them.

SNAKES.—I have suffered very severely from snakes killing the fowls. Snakes get into the fowl-house through the rats' holes. A cobra in a fowl-house will kill half a dozen fowls in a few minutes, and cause a loss of from one hundred to two hundred rupees. The only way to keep snakes out of the house is to keep out the rats. It is easy enough to keep rats and snakes out of the fowl-house, but it is almost impossible to keep the runs and yards free from them. If snakes get into the run, the fowls will attack them and the snakes will turn on the fowls and bite them. As a rule, fowls will not attack large snakes, but will attack and kill and eat small snakes. If the little snake happens to be a cobra, *kerait* or Russel's viper and bites the fowl, the bird will die. I found a fine large game hen dead near the door of her house; on examining her I found she had been bitten by a snake. Her crop was very distended. I had her opened and found a cobra thirteen inches long in her crop. She had attacked the cobra and killed and swallowed it, but the cobra had bitten her in the fight. The only way to keep snakes out of a run or yard is to constantly fill up the holes in the runs and clear away all the jungle and long grass. If some coal tar is poured into the holes and the mouth of the holes closed with bricks, rats and snakes will not get into them.

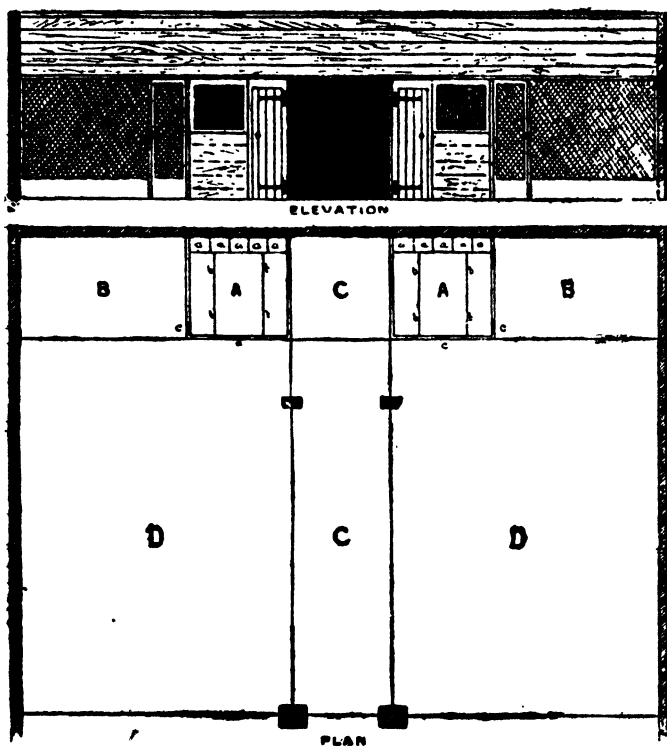
MODEL POULTRY-HOUSE FOR SMALL STOCK.



House, Shed and Run for 10 Fowls.

F. g. 2.

PLAN OF POULTRY HOUSE AND SHED.



SCALE.

Fig. 3.

A A Roosting and laying-houses (10' × 10').

B B Fenced-in covered shed (10' × 20').

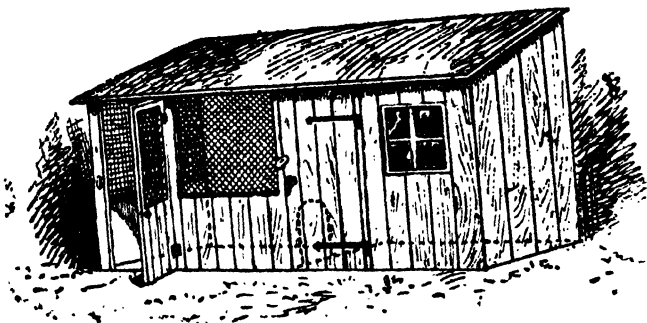
C C Shed and run for sitting-hens.

D D Grass runs. (For 10 fowls, 100' × 30'.)

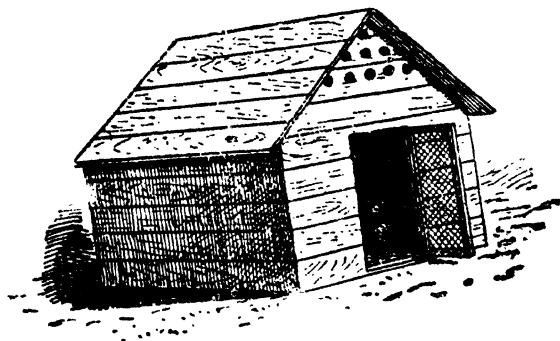
a a Nests.

b b Perches.

c c Trap-doors for fowls to enter.



POULTRY HOUSE AND SHED.
Fig. 4.



POULTRY BOX-HOUSE FOR THE GARDEN, 5 FEET \times 5 FEET
GROUND AREA. TOTAL HEIGHT, 6 FEET.
(Wire-mesh door on wooden frame, and holes bored above doorway
for ventilation.)
Fig. 5.

CHAPTER IV.

FOOD.

THE fowls' food is one of the things that need the most careful attention. Any neglect or mistake in this matter is sure to cause serious loss.

QUALITY OF FOOD.—The quality of the food must be the best. It is no economy to feed on damaged grain and meal, or rotten meat, potatoes and vegetables. Bad food will engender disease.

Of all grain wheat is certainly the best for poultry.

The grain, whole or coarsely ground, and the coarse *atta* and bran are most excellent food for both young and full grown fowls.

Barley is also good, but fowls in India do not readily eat the whole grain ; it must be ground into meal and mixed with wheat meal and skimmed-milk or butter-milk.

Oats, beans, peas and gram are all very good for poultry.

These grains must be bruised and steeped in water before they are given. The oats should be steeped and properly hulled before they are given to the birds.

Indian-corn is very fattening, and must not be given exclusively or very often to poultry kept for breeding or to growing birds. But it is very good for fattening fowls.

Rice has the least value of all grain. It has only seven per cent. of flesh-forming substance and a mere trace of bone-making substance. It must not be given to young and growing birds or to breeding stock, except in small quantities during hot weather, and then alternated with wheat, barley or oats. Paddy is very much better than rice, and is good for the birds in the hot weather.

Boiled rice is good for sick fowls and weak chickens.

Skimmed-milk, butter-milk, and curds are good for fowls, and should be given mixed with ground wheat and barley.

It has long been known that butter-milk is one of the best drinks for invalids and in fact for the average person, but very many who are interested in poultry never seem to realise its value as a drink or food for poultry. Butter-milk contains about the proper amount of lactic acid necessary to induce perfect digestion. It may also take the place of meat to a great extent. It keeps the fowls in a laxative condition, and at the same time furnishes considerable valuable, readily digested food. In preference give it to them in vessels, but if soft food is given them, butter-milk may be used instead of water to mix it with. The fowls are very fond of it, and it has proved as valuable for the hens to induce egg-laying as for the chicks which are making flesh, bone, muscle and feathers at one and the same time and which need a varied diet of the most nourishing foods. It makes the fowls plump and the flesh light-coloured, tender and juicy. As it has proved to be such a great aid to digestion, it is not more than could be expected that fowls which have access to

butter-milk are less subject to cholera or diarrhœa, and this has through years of experience proved to be so.

Skimmed-milk is an excellent food and drink for young chicks, and it may be given them freely at all hours, the only thing necessary being that the vessels in which it is supplied should be kept clean by frequent scouring.

Potatoes are good for fattening fowls, and should be given very sparingly to laying hens. When given to laying hens or growing stock, potatoes should be thoroughly boiled in their skins, the skin removed, properly mashed and mixed with equal part of wheat-bran. Fowls should not be allowed to eat the skin of potatoes.

Fowls need some animal food to supply the waste in their system. Meat of sorts and fresh cut bone or bone-meal ought to be given once a week. Fresh bones, ground finely and mixed with meal, should be given as a substitute for meat. All refuse food, such as scraps of meat, bread-crusts, potatoes, vegetable, rice, dall, curry, etc., from the table and kitchen, should be gathered together, cut up fine and given to poultry.

Green-food is an absolute necessity. Fresh tender grass, onions, garlic, cabbage, lettuce and carrots are excellent. Nothing tends more to keep fowls in health and good condition. The lack of it will injuriously affect the birds and cause the eggs to be poor in quality.

All green-food should be given uncooked, but cut up very finely and scattered over clean ground, or else mixed with the soft food.

Hemp seed, mustard seed and linseed given occasionally in small quantities during the cold season, rains and moulting time are very beneficial, especially to growing birds.

Some people feed their poultry entirely on paddy and rice. Fowls fed entirely on paddy and rice will not thrive. If large well-grown birds are wanted, they must not be fed only on such food. It may be given to Bantams when the object is diminutive size. The village *moorgi* has nothing better than paddy, and that is one of the reasons why they are so inferior in size. If paddy be used as the chief article of food, then it should be alternated with good sound wheat, gram and animal food. Every third meal should be wheat or gram, and some meat should be given twice a week.

CHANGE OF FOOD.—The food needs to be changed at the seasons of the year. During the cold weather they need more heat-producing and stimulating food—such as barley, oats, gram, peas, meat, etc. During the hot weather the birds need cooling food, such as wheat, paddy, butter-milk, and plenty of vegetable. I have found it best to withhold meat during the hot weather. During the rains, from the end of June to the end of September, specially when the birds are in moult, they need to be very carefully fed. Wheat, paddy, barley, gram, a small quantity of meat, onions, and some tonic in the food or water should be given, and plenty of vegetable.

QUANTITY OF FOOD.—It is no economy to starve poultry. They need an ample and regular supply of adequate food. It is also injurious to overfeed them. Overfed fowls are

subject to many diseases from which properly fed ones are free, and cease to lay before the proper time, or are attacked by apoplexy on the nest.

It is difficult to give a fixed scale of food. Cochins will eat twice as much as many other breeds, and different birds of the same breed often have very different capacities for food. The same hen will eat nearly twice as much when laying as when she is not laying. Fowls need more nourishing food in the cold season than during the hot weather.

The one simple rule with adult birds is to give them as much as they will eat eagerly, and no more. Throw the grain around in small quantities on the clean ground, but directly the fowls begin to feed with apparent indifference, pick over the grain or cease to run when the food is thrown at a distance, the supply should be stopped. Food must never be left on the ground. If food is allowed to lie about, a great deal will be eaten in excess, and a great deal will never be eaten at all. Sour or dirty food will engender disease.

The quantity of grain allowed for each fowl will depend upon the extent of the yard and the quantity of scraps they receive from the kitchen and table, and also upon the seasons of the year. If the grass run be a large one, the fowls will forage for themselves and pick up a great deal of food. If the grass run be extensive, and there be a fair quantity of refuse food, then each fowl will need on an average one chittack or two ounces of additional food every day. If the run be small, and there be not sufficient scraps, then two

chittacks will be needed. They will not thrive on less, and more will be injurious.

Then, again, the different breeds will need different quantities of food. The Cochin will eat twice as much as the Orpington or Wyandotte. The Cochin and Brahma need more than the other breeds.

FREQUENCY AND REGULARITY OF FEEDING.—Fowls ought to be let out of their houses into the yard a little before sunrise; they enjoy the cool fresh morning air. On being let out, the first thing they will do is to drink water. Fifteen minutes after they are let out they should be given their morning food. This should consist of wheat, barley or oats, well ground and mixed with skimmed-milk or butter-milk. The whole grain should be ground into coarse meal. Some chopped meat, bread, vegetables and other refuse food and occasionally a very little salt and some poultry powder ought to be added to it. The quantity of food given in the morning must be about one ounce per fowl. If it is found that the fowls grow too fat on this food, it will be advisable to reduce the quantity or give only whole grain in the morning. Some fowls eat largely of the soft food and then refuse to scratch about for more food. These birds will accumulate fat rapidly and stop laying. Such birds should never be given anything more than whole grain, and that should be scattered on the ground so that they will scratch for it.

Many people give their fowls only grain in the morning and soft food late in the evening. They say, feeding in this way makes the birds more active during the day and

they lay more eggs. The most experienced breeders give a small quantity of soft food early in the morning and then give whole grain in small quantities twice a day, and in the evening a large feed of whole grain to sustain the birds through the long night.

If the grass run be large, and the weather be fair, the fowls should be allowed to remain out the whole day and given no more food until the evening. But if they are confined in the shed or in a small run, they need some food at midday. This feed should consist of good sound whole grain. From half to one ounce per bird will be enough. It should be scattered on the ground among leaves, sand and gravel, and the birds made to scratch for it.

The evening feed should be given a little before sunset, shortly before the birds go to roost. A good feed of sound grain ought to be given at this time, for a long night is before these always hungry creatures. Wheat or some other whole grain ought to be given, in the proportion of half to one chittack or one to two ounces per fowl.

PREPARATION OF FOOD AND MODE OF FEEDING.—The grain for the morning feed should be well ground and mixed with water, skimmed-milk or butter-milk. Butter-milk and skimmed-milk are splendid food for fowls, and when obtainable, should be given in preference to meat. Great care must be taken not to make the food too moist. Only enough milk or water must be allowed to make it easily crumble. Season occasionally with a little salt and poultry powder, and add the scraps of meat and vegetables ; once a week raw

onions and garlic, chopped finely, should be added to it. Freshly-made charcoal finely ground and added to the food is very beneficial to both chickens and adult fowls.

Boiled carrots, turnips and beetroot, chopped fine and mixed with wheat-bran, is excellent food for poultry. Ground bones and a little salt should be added to this. When salt is given to fowls, it should never be given in a dry state. Dissolve the salt in water and mix the flour and bran with it. One teaspoon of salt is sufficient for thirty or forty adult fowls.

The kind of food used for the morning meal should be frequently changed. Poultry thrive better if the food is varied.

Soft food should be placed in small quantities in wooden troughs or shallow dishes. Soft food should be only soft enough to crumble easily, but not stick to the fingers; wet food is positively injurious to fowls. If the meal is too soft and sticky, some wheat-bran must be added to it.

The grain must be thrown far and wide on the gravel shed-floor. When the yard is small, the feeding-ground must be covered over with dry leaves, hay, sand and small gravel. This will give the fowls exercise and occupation in finding the grain, and will tend to keep them in health.

WATER.—Fowls are thirsty creatures, and should be given plenty of pure drinking-water. The water-vessels must be scrubbed overnight and kept near the shed-door ready for use in the morning. Early in the morning before the fowls are let out, the vessels must be filled with water. The water must be changed again at 4 P.M. A few drops

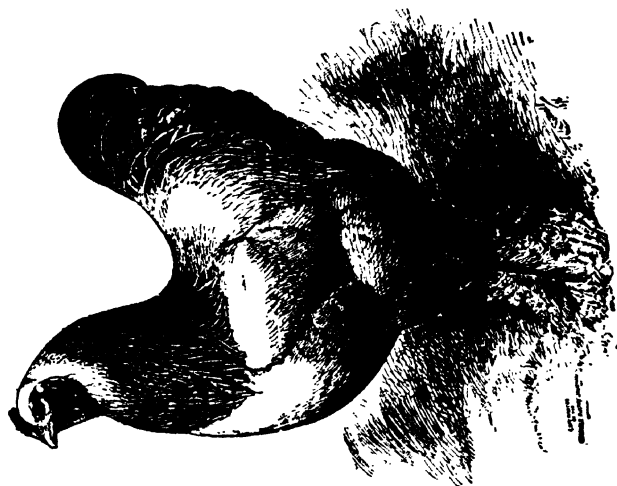
of Condry's fluid or Douglas' mixture should be added to the water. Never leave the water in the sun.

LIME.—Lime is a necessary article of food for fowls. It supplies the substance for the egg-shells. If fowls are not allowed sufficient lime, they will not thrive, and will lay soft-shelled eggs. The lime must be slaked and mixed with sand or pounded brick, and placed in a box in the shed. Old lime-plastering will do very well.

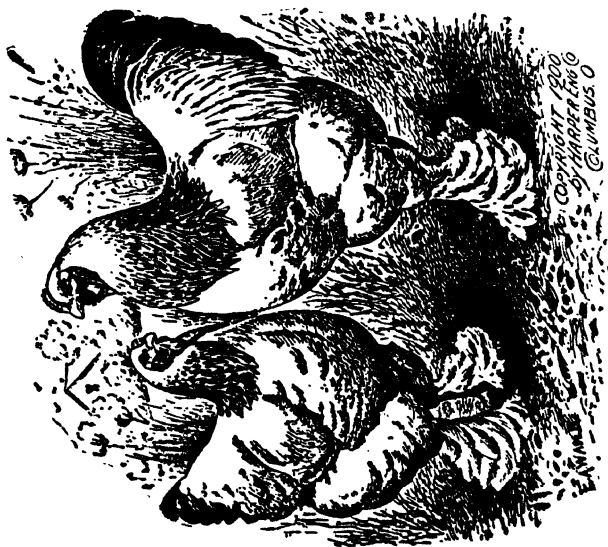
SHARP GRIT.—Sharp grit is absolutely necessary to the health of the fowl. A constant supply should be kept in the run near the feeding trough. The grit must be sharp. Blunt-edged grit will be of no use. The way to do is to break up some old crockery, flint or rock with a hammer and pass the small pieces through a sieve. The sieve must be of one-eighth inch mesh. All that passes through this sieve will do well for the birds.

CARE OF COCK BIRDS.—It has been my experience that unless the cock birds are given extra food a great percentage of the eggs are infertile. To place a box or cage in the pen and put the male bird in it and feed him separately with extra food is only a few minutes' work. Another way is to feed the hens in the yard, but leave the cock by himself in the shed and feed him there. Care should be taken to not get him too fat. The hens should also be fed very carefully if you want good, strong chickens.

COST OF FOOD.—The cost of feeding fowls varies much according to locality, management, and price of grain. Wheat, barley, oats, peas and gram can be had at from three rupees



LIGHT BRAHMA COCK, AMERICAN TYPE.
Fig. 7.



PAIR OF LIGHT BRAHMAS, ENGLISH TYPE.
Fig. 8.

to six rupees per maund, or 82 lb. It will be economical to grind the grain and make your own meal and bran.

If you trust your servants with the feeding of the fowls, the food will cost twice as much as it otherwise would, or the fowls will be starved. Personal care goes a great way in reducing the cost of keeping poultry.

HOUSING.—The following article by “A Practical Poultryman” about housing and feeding poultry will be of interest to all beginners :—

“The next question relates to the housing of poultry. Birds do not need warmth so much as air.

“Healthy hens will maintain better health when roosting in the trees in the most severe weather of winter than in faulty houses. It has been sometimes stated that the heat of the hen-house in winter is followed by the production of a larger number of eggs; if such has been the case, we are quite satisfied that in the main the hens suffer in health.

“The hen-house should be built facing the south and so arranged that it catches the morning sun.

“Light appears to be contrary to the ideas of the old-fashioned poultry keeper, whereas it is the enemy of disease, and specially of deadly microbic life. A perfect poultry-house should have no wooden floor, but a floor of earth laid upon at least eight to ten inches of cinders, broken bricks and gravel, and covered with a layer of sand, which will facilitate the daily removal of the manure with the broom. Cleanliness should be the first consideration. The house should be well ventilated but not draughty, and the door

should be of wire-netting ; care being taken to prevent the birds being in a draught. It may be well whitewashed without and within ; lime-wash being used at least every month, chiefly for the destruction of parasitic life. The best roof is thatch, for it is warm in winter and cool in summer ; whereas iron makes the worst form of roof. The house should be as large as possible, as over-crowding is fatal.

“ The run or enclosure in which the birds are kept should be large also and well provided with shade.

“ *Feeding.*—We now come to the question of feeding. Whether we intend to provide meat or eggs, we are bound to consider one fact, that both materials are composed of substances containing lime, fat or oil and albuminous matter containing nitrogen. Unless, therefore, these materials are supplied in the food in sufficient abundance, neither meat nor eggs can be manufactured to the fullest extent.

“ In addition to these materials, the food of the hen contains starch, or its equivalent, sugar, gum or cellulose, these being the carbonaceous constituents of food and chiefly employed in combustion and the maintenance of the heat of the body. Now, it is possible to feed a hen on grain which provides her with more starch than she requires and less meat or egg-making material than is necessary. If this is done, as it may be by Indian-corn feeding, there must be waste of one constituent because there is not sufficient of another to carry the process further.

“ There is no doubt fowls require more of that class of food which is rich in nitrogen than they obtain, and for

this reason we strongly recommend that, in addition to grain, animal food should be liberally provided. The best form of meat is that which is the least stimulating, such as the white meat of the intestines and the pouches of animals. It is more digestible than the average coarse muscle, more nourishing, and less costly and stimulating. The chief difficulty is in the process of cleaning and cooking, and this becomes the stumbling-block in the average poultry-yard, for it may be claimed by some at least that if all this labour is necessary the game is not worth the candle; but the same remark applies to all other industries if they are to be carried out properly. The cheapest grain foods are not those which cost the least per maund, unless the weight of a cereal varies, but when we have reduced each cereal to equality of weight, we have still further to ascertain the proportion of feeding matter each cereal contains. Indian-corn, for example, contains more nutritious and digestible feeding matter per cent. than oats, so that at equal prices per maund Indian-corn is much the cheaper of the two; and yet Indian-corn is not so typical a food as oats because of its larger proportion of starch. If, however, Indian-corn is used in conjunction with animal food, we can make the greatest use of it in the cold weather, and the remark applies equally to wheat, which may be used almost in the same way. In 100 pounds of wheat there are about 77 pounds of digestible food as against 56 pounds in oats, and in estimating what food to use we are bound to take this fact into consideration. The best grain for both production

of eggs and meat is wheat and oats given alternately, or, better still, oats ground together and given in the form of meal, and wheat given whole. During the hot weather paddy may be substituted for oats. We must not forget that all fowls require green food, material for making the shell of eggs, and exercise."

CHAPTER V.

THE SELECTION OF BREEDS.

THERE are many breeds of fowls. Some are beautiful ornamental birds, well worthy the attention of fanciers who can afford to keep them for mere show. Some are both beautiful and useful birds, and can be kept profitably by all people with ordinary care and economy. Some are very delicate birds and do not thrive in India ; others, again, are hardy and not only thrive well but multiply rapidly.

OBJECT IN KEEPING POULTRY.—The selection of the breeds to keep will depend entirely upon the object with which fowls are kept. Some persons keep fowls as mere ornaments and pets ; others keep them for the benefit of the household, and use the eggs and fowls for the table ; others, again, keep them to breed from and sell. The class of people first mentioned generally select the most showy and expensive birds. The second and the third classes of people mentioned, would be wise if they combined their interests and kept only such fowls as will furnish ample produce for the consumption of the family as well as a surplus which can be readily sold at a profit and help to defray the expenses for the keep of the poultry.

DELICATE BREEDS.—I will first mention some of the breeds that are very handsome, but are either too delicate for India, or unproductive, and consequently not worth the while of people who desire profit from poultry-keeping. Such are the different varieties of white-faced Spanish fowls; all the varieties of crested Polish fowls; the Crêve-cœurs and Bantams. The Dorking is a splendid breed of fowls, but extremely delicate, and the hens are indifferent layers. The Houdan is a good general purpose fowl, but will not thrive in all parts of India. The climate of Bengal, Assam, and the Duars, where the rainfall is heavy, is quite unsuited to this breed. They may thrive better in the dry and nicer climate of the Punjab and the Central Provinces.

THE BEST LAYERS.—(1) Wyandotte, (2) Rhode Island Red, (3) The Orpington, (4) Langshan, (5) Rock, (6) Sussex, (7) Brahma, (8) Chittagong, (9) Cochin, (10) Game, are the best layers among the larger breeds. (1) The Leghorn, (2) Minorca, (3) Andalusian, (4) Campine, are the best layers among the smaller breeds.

All hens of the same breed do not lay alike. Some hens of the best-laying breeds are the worst layers, and some hens of the worst-laying breeds lay very well. Pure-bred birds of a good strain are capital layers. When the birds are bred from only the best layers, and this is done year after year after most careful selection, the good qualities are established in the birds and the strain is made.

THE LARGEST AND MOST WEIGHTY BIRDS.—(1) Brahma, (2) Langshan, (3) Orpington, (4) Rock, (5) Chittagong,

(6) Wyandotte, (7) Game, (8) Cochin, (9) Sussex, (10) Rhode Island Red.

THE MOST HARDY BIRDS.—(1) Brahma, (2) Langshan, (3) Chittagong, (4) Orpington, (5) Rock, (6) Wyandotte, (7) Sussex, (8) Cochin, (9) Game, (10) Rhode Island Red.

THE BEST TABLE FOWLS.—(1) Asseel or Game, (2) Chittagong, (3) Langshan, (4) Wyandotte, (5) Rock, (6) Orpington, (7) Sussex, (8) Rhode Island Red.

EGGS.—There is an old and prevalent notion that dark-shelled eggs are richer than white-shelled ones, and there can be no doubt that this is to a certain extent true, though by no means absolutely so.

Langshans, Game or Asseels, Plymouth Rocks, Brahmas, Cochins, Orpingtons, Rhode Island Reds, and Wyandottes lay the richest and darkest-shelled eggs, while the eggs of the Spanish and Polish varieties are the whitest of all. The eggs of the Bantam and Hamburg, though very small, are the nicest in flavour. A good-sized egg should weigh from two to two-and-a-half ounces, or from five to six tolas. Ordinary eggs weigh less than one-and-a-half ounce each. All eggs above one-and-a-half ounce are very fair-sized.

All hens of the same breed will not lay eggs of the same colour or size. Some Brahmas, Plymouth Rocks, Wyandottes, and Orpingtons lay white eggs, and some very dark eggs.

NON-SITTERS.—The Houdan, Leghorn, Hamburg, Minorca, Campine and Andalusian are non-sitters. When any of these breeds are kept, hens of some sitting-breed or an incubator must be kept to hatch the chickens.

THE BEST SITTERS AND MOTHERS.—Silkies, Wyandottes, and some Bantams are the best sitters and mothers. The Brahma, Cochin, Rock, Orpington, and Langshan are excellent sitters and mothers, but they are very heavy and apt to be clumsy with their eggs and chickens, and destroy many of them. Very large heavy hens should not be set. The Game and Chittagong are splendid sitters and mothers, but they will kill all the other chickens, and wound all the hens in the yard if not carefully watched; they will also peck their own chickens to death when enraged by the other fowls. For this reason they should not be set. The common country hen, called the *Pati*, is, as a rule, the best mother of all fowls. She is not much larger than the Bantam, and is very vigilant and a grand forager. But it must be borne in mind that all hens of the same breed are not equally good mothers. They differ in this as much as in laying qualities.

THE BEST BREEDS TO KEEP.—If the object of keeping fowls be only the pleasure of keeping and breeding them for home use and exhibition, the selection should be made from one of the following breeds:—(1) Brahma, (2) Cochin, (3) Langshan, (4) Orpington, (5) Rock, (6) Wyandotte, (7) Silkie. If, however, the object is to obtain a good supply of chickens for the table, as well as good birds for profitable sale, the selection should be made from the following breeds:—(1) Wyandotte, (2) Langshan, (3) Orpington, (4) Rock, (5) Sussex, (6) Brahma. But if the object be to obtain only a large supply of eggs and birds for profitable sale, then

the selection should be from the following:—(1) Wyandotte, (2) Orpington, (3) Langshan, (4) Rhode Island Red, (5) Rock, (6) Brahma, (7) Chittagong.

For all-purpose fowls—fancy, table, and eggs—the following breeds cannot be beaten: (1) Langshan, (2) Orpington, (3) Wyandotte, (4) Chittagong, (5) Rock, (6) Brahma, (7) Rhode Island Red.

OTHER INDIAN BREEDS.—There are breeds of fowls in India resembling the Leghorn and Hamburg in size and shape and of very fair laying qualities; they are of various colours. Another breed obtainable in India resembles the Sussex, Rock, and Wyandotte in shape, but are smaller and of different colours. They are very good layers. These fowls are found all over India, but specially in Bengal. I procured some excellent hens from Nulchetty, a place on the river between Calcutta and Barisal, and mated them with a Chittagong cock: this cross produced some large and fine table birds. On the western side of India the Busra fowl has proved a very useful bird. If the object of keeping poultry be only to procure eggs and ordinary table fowls, then no better fowls than these need be kept.

A PROFITABLE METHOD.—It costs no more to keep pure-bred birds than it costs to keep inferior ones. Pure-bred birds are much more satisfactory as layers and for the table, and sell for more money. It is always best to keep the breeds pure and not cross them, but when this cannot be done the following plan may be adopted:—Keep a stock of pure-bred fowls and some hens of other breeds, say one

cock and two hens of a pure breed and two or four hens of another breed. Set the eggs of the hens of pure stock, and raise the chickens to replenish the stock, or sell. The eggs of the hens crossed by the pure-bred cock may be used for the table, or set, and the chickens used for the table. This plan will insure keeping the main stock pure, and at the same time producing good eggs and fowls for the use of the household.

The pure-bred chickens will fetch good prices; the cross-breeds well also sell well for table use.

THE BEST CROSSES.—The following breeds crossed produce good table fowls and fair layers:—

(1) Langshan, Rock, Wyandotte, Orpington, Rhode Island Red, Brahma and Minorca hens crossed with the Indian Game or Chittagong cock produce good birds for the table and fair layers.

(2) Indian Game and Chittagong hens crossed with a Langshan, Orpington, Wyandotte, Rhode Island Red or Brahma cock will produce good layers and table birds.

(3) White or Barred Rock and White Wyandotte and White Orpington make a very good cross.

(4) Black Langshan and Black Orpington and Dark Brahma are a good cross, and also a Black Langshan cock with a Black Minorca hen for egg production.

(5) Rhode Island Red and White Wyandotte and White Orpington produce a good cross.

(6) The Dorking or Sussex cock mated with Brahma or Cochins hens give good table birds.

(7) The Rock cock and the Brahma hen produce very good table birds and fair layers.

(8) The Dorking and Sussex mated with the Indian Game, the Chittagong or the Brahma produce very good table birds.

The above-mentioned are the best crosses that can be made. Promiscuous crossing will produce nothing but evil results. Cross-breeding is to be avoided as much as possible, but when two pure breeds are to be mated together, the above-mentioned plan should be strictly followed.

When one breed is crossed with another breed, cocks and hens of the same colour, or as near the same colour as possible, should be selected. Hens with long legs should be mated to short-legged cocks, and hens with short legs should be mated to rather tall cocks. The birds should be as large and broad as possible and in perfect health.

The cross-bred cockerels should be used for the table when they are between three and four months old, and the best pullets should be kept for laying purposes. These pullets should be mated with pure-bred cocks of the same breed as their fathers. This process should be continued every year. The cross-bred hens should be killed for the table when they are between nineteen and twenty months old.

THE WAY TO IMPROVE THE COMMON COUNTRY FOWL.—
The country fowl can be greatly improved by crossing the best hens with the Chittagong, Langshan, Orpington, Wyandotte, or Rhode Island Red cock. Select sixteen of the argest and best country hens you can get and let them run

with two good pure-bred cocks of either of the above-mentioned breeds. Then take sixteen of the best of these cross-bred pullets and put them with two cocks of the same breed as the father of the pullets. The next year take sixteen of the best pullets of the second cross and mate them to a couple of pure-bred cocks of the same breed as the previous cocks. This process may be repeated for about five years, and there will be a wonderful transformation and improvement in the fowls of the country.

I have seen the following plan worked successfully :— First, put sixteen good large young country hens with two good pure-bred Chittagong cocks ; second, take sixteen pullets of the first cross and put them with two pure-bred Brahma cocks ; third, take sixteen of the best pullets of the second cross and mate them to a couple of pure-bred large-bodied and short-legged Langshan or Orpington cocks finally, take sixteen good pullets of the third cross and put them again with two pure-bred Langshan or Orpington cocks. The birds that I saw of the fourth cross were large, heavy birds and very fair layers, but were of very mixed colour and varied shape.

The best results are obtained from pure-bred cocks. The cross-bred cocks and cockerels should not be bred from. When cocks of the same pure breed are used in each successive cross, the results are much more satisfactory. In such a process as this the cost will be small. The price of two good cocks suited for the purpose will be quite within thirty rupees.

When selecting the pullets to breed from, only large-bodied, well-shaped, healthy birds that are also good layers should be chosen.

POULTRY-BREEDING IN INDIA.—Of late years there has been a great advance in poultry-breeding all over the world. England, Scotland, Ireland, America, Canada, Australia, Germany, France, Belgium, Sweden, Denmark, and South Africa have all waked up to the realisation of the fact that poultry-raising is a very important industry and far more profitable than many other branches of agriculture. Not only have the poultry indigenous to the country been improved and their value as layers and table birds increased, but valuable birds from other countries have been imported and used to further improve the indigenous breeds, or kept pure and bred so as to produce the best results for laying and table purposes. The fancy side of poultry-breeding also has received a great impetus. We find the Royal Family of England foremost among poultry fanciers and exhibitors. Queen Victoria was an enthusiastic poultry fancier, and had some of the finest birds in her Royal farms and aviaries. Some of the best families of England are successful poultry breeders and exhibitors.

In India also there has been a decided awakening in favour of poultry-breeding, and a great many people among Government officials, planters, railway employees, and missionaries and also a number of Indian noblemen and gentlemen have taken a kindly interest in our feathered friends, and the prospects for the welfare of poultry in India are

to-day brighter than they ever were before. Nevertheless, there is still a great deal of ignorance about the different breeds of fowls, and their economic value, and their proper breeding and care. We shall do our best to assist people to a proper knowledge of these things and help them to success.

In the first place, we will consider the value of the best breeds of fowls found in India. There are really only two or three pure breeds of fowls indigenous to India. The first is the Chittagong breed, and the other is the Asseel, and in Western India the Busra fowl. There is a large number of fowls of different sizes, shapes, and colours to be found all over India. These are for the most part very much like the jungle fowl. Their size and shape vary according to the locality in which they have been raised and the care with which they have been bred ; some of them have Chittagong, Asseel, Langshan, Brahma or Orpington blood infused into them, and are better in size and quality than the common ones.

The common Indian *moorgi*, as found in all parts of this country, is of very little value as a layer or table bird.

Those that have been produced by a cross with the Chittagong and Asseel are larger birds, and find a good market in Calcutta and other cities and towns in India. A cross between the Chittagong cock and the common hen will produce very fair table birds, and a cross between the Langshan, R. I. Red, Wyandotte or Orpington cock and the common hen will produce very fair layers. I have seen some birds that were produced by a cross between the Chittagong cock and



LIGHT BRAHMA HEN, AMERICAN TYPE.

Fig. 8.



PAIR OF DARK BRAHMAS, ENGLISH TYPE.

Fig. 9.

the common hen, and the pullets of this cross and the Langshan cock. They were of good shape and size and laid very well, some of them weighed 6lb. alive. A great deal can be done by Government officials, planters, railway people, and missionaries to improve the common village fowl. A great deal of time and labour is needed to attain success in this matter. In the first place, the village people must be persuaded to get rid of *all* their common cock birds and sell off all the common cockerels before the birds are three months old, and keep only the largest and best among their hens and pullets. Then, in the second place, large numbers of medium-sized Chittagong, R. I. Red, Wyandotte, Orpington or Langshan cockerels, between 8 and 10 months old, must be distributed among the villages. Then, again, the next year all the cross-bred cockerels and cocks and the common hens must be removed, and only the best cross-bred pullets allowed to remain. These cross-bred pullets should be allowed to run with the pure-bred Chittagong, Rhode Island Red, Orpington, Wyandotte or Langshan cocks. The third year all the cross-bred cockerels and the hens of the first cross should be removed, and the best pullets of the second cross allowed to remain. These pullets must be allowed to run with a fresh lot of pure-bred Chittagong, Rhode Island Red, Wyandotte, Langshan or Orpington cocks. Every second year the pure-bred cocks should be changed and new ones put in their place. The cocks of one village can be put in another village, a few miles away. By working on these lines, in five or six years the

characteristics of the fowls in the village will be entirely changed. They will be large, hardy, and good layers of large eggs, and will sell for more than double the money that could be got for the small common fowls. In six years these improved fowls will be very much like pure-breeds in size and shape. The initial cost of working this plan is not much. It does not need money so much as work and perseverance. Fifty good Chittagong or Rhode Island Red cockerels can be obtained for, say, Rs. 150, and these fifty put in one village will work a wonderful change in a few years. But it will be of no use whatever to put these cockerels in a village unless the common cocks and cockerels are first removed and all the cross-bred cockerels are removed as soon as they are three months old. If the common or cross-bred cocks are allowed to remain in the village, all the good work will be spoiled.

I advocate improving the village fowls by crossing with the Chittagong, Rhode Island Red, Langshan, Wyandotte and Orpington cocks. The cocks of these five breeds are the best for this purpose. For the European, Eurasian and the better class of Indians I would advise a different plan altogether. There is no need for them to waste time and energy in trying to improve the common fowl. They should keep only pure breeds, and try to perfect these pure breeds and produce the best layers and table birds. An intelligent person will succeed better with pure breeds than with cross-breeds, and he will attain his purpose, be that utility or fancy, better and quicker with the pure breeds.

THE NUMBER OF BREEDS TO KEEP.—I want to repeat the wholesome advice so often given to people about keeping only one breed or variety of fowls. On visiting a friend's poultry-yard I saw Light and Dark Brahmas, Buff Cochins, Black, Buff and White Langshans, Chittagongs, Houndans, and some fowls of no breed, all running together and all kept in the same house. I tried to give some necessary advice, and suggested the need of having separate pens and runs for each breed. My friend said, "I have not the room on my ground for so many runs, and there is no need for them either, as the birds keep separate; the birds of different breeds keep by themselves." After that I shut my mouth, for I felt what an utter fool I was for keeping my birds separate and spending money and labour in doing so, when the birds could attend to that matter themselves without any assistance from me. My friend showed me some chickens that he was trying to rear. I asked him of what breed they were. He called one Brahma, another Langshan, another Cochin, another Chittagong. But even after my 40 years' experience I was unable to distinguish the breed of these chickens, so I concluded that they must be some new varieties of the breeds—varieties that I had never seen before. Many people are most stupid about the selection of their fowls and the number of birds they keep. They want to keep eight or ten varieties of fowls; their only object in keeping them is to gratify their ambition to possess many breeds and their desire to see pretty birds. They soon get tired of the birds and allow them to mix up and

deteriorate. If the object of keeping fowls be a supply of eggs, or a supply of meat for the table, or to breed prize birds, whatever the object be, better results can be obtained by keeping only one breed. Select your breed and keep two or three pens of that one breed, keep one cock and five to seven hens in each pen. Spend your money, time, thought, and labour to improve the birds of that breed and make them as perfect as possible. By doing this you will derive a great deal of pleasure and profit from your birds. Very few persons are able to keep many breeds of fowls. They have neither the time, brains, nor energy for the work, and when they try to do it, the consequence is failure, disappointment, and disgust. One more person goes out crying down poultry-breeding and prejudicing people against it. When I see such a person, I say, "well, he is another fool added to the multitude already in the world."

There are a few persons who have succeeded with three or four varieties; they started with one, and when they had thoroughly studied the breed and improved it as far as possible, they took up another breed. They worked with the second variety as they did with the first, and succeeded with this also. Such men are bound to succeed; they have the qualities necessary for the work; they do not spare themselves in trying to gain the object they aim at. Such men can take up one breed after another until they have 10 or 15 varieties, and all testify to the care and labour devoted to them.

The conclusion of the whole matter is this. It is not the fowls, it is the man or woman who handles them that is the

main factor in the business. A fool will fail with even the best birds, whereas a man with some commonsense—or rather, uncommonsense—will do well with ordinary fowls.

ADVANTAGES OF A SINGLE BREED.—The caption of this article is hardly comprehensive enough, for it is intended to discuss not only the advantages to be derived from limiting one's choice to a single breed, but also the advantages accruing from sticking to that breed through good report and evil report, in days of popularity and days when popularity seems irretrievably lost. This article is intended for the beginner rather than the veteran, for the one who has made but a partial study of poultry-culture.

Whatever may be the best course for an experienced poultry-breeder—whether he keeps one or many breeds—there is no doubt that for the beginner one breed is sufficient, and that if he so limits his choice, he will obtain much more satisfactory results than if he starts with several breeds. Success with a breed is conditioned upon a competent knowledge of the breed. Different breeds require different management. What will produce good results with one will often produce bad or indifferent results with another. The feeding and care must be adapted to the requirements of the breed to obtain success. A Leghorn, for example, is an active, sprightly fowl, demanding and taking a large amount of exercise. It does not lay on fat readily. Its nervous vitality demands fattening food—that is, carbonaceous or heat-producing foods, in order to keep up its activity. A Cochin, on the other hand, is of a sluggish disposition, little disposed



PAIR OF DARK BRAHMAS, AMERICAN TYPE.

Fig. 10.

to hurry in its movements, taking of its own will but a moderate degree of exercise and readily developing adipose tissue. It does not require so large a proportion of heat-producing food in its daily rations as a Leghorn, but does require a larger percentage of nitrogenous food. The management and the feeding which will produce the best results must be quite different with these two breeds. Hints and suggestions can be given but experience alone can give the adequate teaching that leads to success. The beginner has everything to learn, and if he studies a single problem, he will succeed much better than if he has a number of problems to study at once.

Again, successful breeding demands that the breeder shall have a correct ideal of what he desires to produce. He must have the shape, colour, marking, habits—in short, everything that is required to make a perfect specimen of his chosen breed—well fixed in his mind. A correct ideal of any breed is made of many minute details, and the omission of any one of these means, to the extent of that omission, a distorted ideal. The ideal a breeder has, will determine all his matings, and if he is so fortunate as to realize his ideal, his success will be proportioned to the correctness of that ideal. His results will never surpass his ideal; hence the great importance of a correct ideal. And if one has but a single breed, the chances of obtaining a correct ideal are much greater than if he has several breeds.

And once more, the realization of an ideal in breeding depends upon a knowledge of the breeding tendencies of

the chosen breed. These tendencies relate both to colour and to shape, and they control every mating that is made. Take, for example, the Barred Plymouth Rock. A person may know just how to mate this breed to produce success, because he has studied the breed. He knows that the males have a tendency to be too light in colour and the females too dark. He knows that this is a natural tendency from the history of the breed, and that, though it is now nearly 40 years since breeders have sought to bring the two sexes to a uniform shade, the tendency fixed by the origin of the breed has not been fully overcome. He knows, therefore, that to secure the correct colour he must mate his birds to overcome this tendency, and to do it he must make special matings. But suppose he is a beginner, and instead of having one breed he has six or eight, how long, think you, will it be before he hits upon the exact matings that will bring uniform success? The man who has succeeded in poultry-breeding is he who took but a single breed to start with and later added a second, after he had mastered the first one.

Now, all these things—the study of the proper management and feeding, the learning of the habits and characteristics, the formation of a correct ideal, and the understanding, through a knowledge of the breeding tendencies, of how to realize that ideal—give ample scope for the exercise of the talents of any beginner. He certainly does not need to have his mind diverted from the one chosen breed and have his studies multiplied by five or ten, in order to give sufficient employment to his faculties.

But there is another advantage in limiting one's choice to a single breed that is seldom mentioned, but really deserves careful consideration. If one has only a single breed, when the time comes to introduce fresh blood, he need buy but one or two male birds—if he introduces it from the male side. If he has five breeds, he will need to purchase five or ten birds. The majority of breeders, whether they have one or more breeds, have but a limited amount of money that they feel willing to set apart for this purpose. Say for illustration, that this sum is Rs. 300. The breeder who has limited his choice to a single breed can buy three birds at Rs. 100 each and thus insure the purchase of not only well-bred but of superbly excellent specimens. The one who has five breeds will have 15 birds to purchase, and he can spend but Rs. 20 on each specimen—a sum sufficient to purchase fairly good birds, but not birds of the character that Rs. 100 will buy. All the next season the flocks will show the effects of these purchases. The one who can afford to spend five times as much for his males, will, other things being equal, improve the quality of his flocks much more rapidly than could the other man.

There is a decided advantage from a business point of view in being known as a breeder of one breed. In other words, after making the selection of a breed, it pays to stick to it. As a poultry writer, one needs to know many breeds : as an experimenter and producer of new breeds, it is necessary for one to handle nearly every kind ; but as a breeder who expects to get pleasure or make money out of his fowls, he



PAIR OF BUFF COCHINS, ENGLISH TYPE.

Fig. 11.



PAIR OF BUFF COCHINS,

AMERICAN TYPE.

Fig. 12.

needs to cling to some one breed. I could hardly condemn the breeder of many breeds—it would be very inconsistent for one who from first to last has studied every breed and owned nearly every variety—but I can from this wide experience see the advantages of a breeder sticking to a single breed.

In the first place, it gives the people confidence in his stock. They say he breeds only one kind ; there will be no chance matings among his fowls ; he will know what he is about ; he can give the buyer the best of the kind. And, singularly enough, people will also argue that as the breeder is a sensible man and has selected one breed, that breed must be the best breed to be had. If he issues a circular, the public's attention is not distracted by rival claims of different breeds, so that it does not know what to buy, but it is focussed on a single breed and is convinced that that is the breed to buy, and so the orders flow in in a golden stream.

Again, the breeder who has a single breed, and sticks to it, gets the full advantage of his exhibiting and advertising. Each year's prizes are cumulative. People remember that this man won on Buff Orpingtons or White Orpingtons at the best shows. His advertising becomes cumulative also, and his name becomes, through the law of association of ideals, inseparably connected with the chosen breed. If one wishes to purchase a given breed, he will at once think of the breeder who has stuck to it for so many years.

It is a strange thing, but it is nevertheless true, that no man's name becomes equally associated with even two breeds ; it stands for one, and the second is recalled only by an effort of memory.

If he should cease advertising, or if he should give up breeding that one breed, five years from now, there would be people ordering that breed from him if he were still alive.

I have received inquiries for breeds which I had given up for a longer period than fifteen years, so lasting are the influences of advertising and of reputation. I have sometimes thought that people consulted old advertisements in preference to new ones, so persistent have been the calls for breeds long abandoned.

One breed is enough for the beginner ; if the veteran adds several breeds to the one of his choice, still his chief reputation will rest upon a single breed ; and to obtain the best financial results, beginner or veteran needs to persist in the choice he has made, for in no other way can he secure the cumulative advantages of his winnings and his advertising.—*Babcock*.

POULTRY FOR THE TABLE.—It is gradually dawning upon the poultry-keeping community in India that the old system, if system it can be called, is as useless as it is stupid, and that unless birds are kept upon a rational principle, profit is practically impossible. If we assume that an average laying hen costs an anna a week for food, or Rs. 3 per annum, it follows that, putting out of sight for the moment the question of labour and other expenses which follow where hens

are kept in large numbers, profit is absolutely certain unless there is some very gross ignorance in the management. If, however, we add to the cost of the food the sum spent for labour, the interest of the money invested in the birds and their houses, the rent of the land and the losses which occur from deaths, even then there should be a substantial profit gauged from the point of view of the sum of money invested. I am not among those who believe that poultry-keeping as an industry is able to maintain an individual European or a European family in India. It should be combined with some other form of work, and it can be so combined. But there are a large number of Indians and poor Eurasians who could easily earn from 25 to 100 rupees a month from poultry-breeding, and comfortably maintain a family.

Poultry-keeping in the hands of the average individual should, in the way I have suggested, return an ample profit. It is the object of this article to show upon what basis such profit can be most surely obtained. I have nothing to do here with what is termed "show poultry." Pure breeds are intended and from among those breeds you should select the most useful of their kind.

No man in his senses would keep the Dorking for the production of eggs, or the Leghorn for the production of meat. Let us first endeavour to classify the chief table and egg-producing breeds.

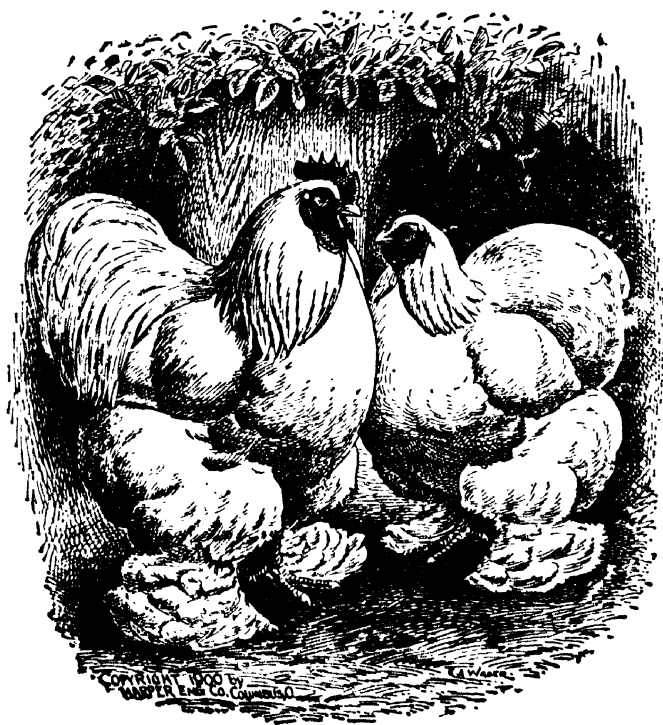
Table Breeds.—Indian Game, Chittagong, Dorking, Sussex, Langshan, Wyandotte, Rock, Orpington, Brahma and Rhode Island Red. Given in order of merit.

Egg Producers.—Wyandotte, Rhode Island Red, Orpington, Langshan, Rock, Brahma, Chittagong, Cochin, and Indian Game. Among the smaller breeds—Leghorn, Minorca. Given in order of merit.

Table Fowls.—Supposing the poultry breeder's desire is to produce chickens for the table, his first object should be to secure birds of the right type and quality; he must next learn how to feed them, and, lastly, how to breed them.

There is no question about the fact that the finest birds for the table are the Indian Game and the Chittagong. The Sussex, the Dorking, the Wyandotte, Langshans and the Orpington in their pure state produce as fine table birds as can be found anywhere in the world. Now, it is possible, by breeding and feeding carefully, to obtain fowls which, in the best season of the year, will be worth from annas 8 to Rs. 3 each for table purposes.

EGG PRODUCTION.—We now pass to egg production. A hen consumes sufficient food to enable her to produce a larger number of eggs than is her average. The average cow of this country yields from two to three seers of milk a day, but cows are bred to yield 14 seers, and many produce 16 and 18 seers. Similarly, instead of sixty eggs, which is probably in excess of the average produced per hen in this country, hens can be induced to lay 120 to 200 eggs by the process of selection and by proper feeding. There is no doubt that even this figure will be exceeded, as breeders pay more attention to selecting their breeding stock from the best layers only, and as they grasp still more clearly the



PAIR OF WHITE COCHINS.

Fig. 13.

principle upon which the system of feeding is based. If, however, the average poultry-keeper could obtain 160 eggs per hen per annum, he would do very well indeed, but this is altogether out of the question, simply because people will not devote that study to the subject which it really demands.

When we say that certain breeds are the best laying breeds, we do not forget that the exhibition system in England and America does a great deal to destroy their laying power, and a person buying hens for economic purposes should be guarded against making any selection from the poultry-yards of individuals who are constantly exhibiting their birds.

The Langshan, the Orpington, the White Wyandotte, the Rhode Island Red, the Brahma, the Rock, and the Sussex are the best fowls to produce large brown eggs.

The Chittagong lays smaller eggs.

Leghorns, Minorcas and Campines lay good-sized, white-shelled eggs.

CHAPTER VI.

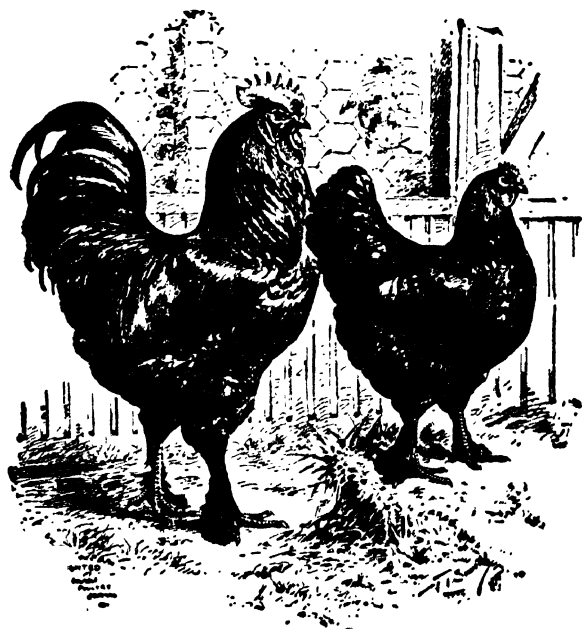
THE DIFFERENT BREEDS OF FOWLS.

THERE are many breeds and varieties of fowls to be found in Europe, America and Asia. I shall describe only such breeds as are profitable to keep; I shall endeavour to mention their merits in as few words as possible.

1. **BRAHMA.**—The Brahma is the most prominent of all breeds, and is unequalled as a family fowl. It is valued for its great size and hardiness, and for its being a good layer of rather large-sized and rich eggs. A good strain of the Brahma, especially the Light Brahma, will lay just as many eggs as the Orpington, Wyandotte, Langshan, or Rock. The flesh of a four to six month old bird is very good; that of older birds is rather coarse.

Brahmas are exceedingly quiet and tame, and can easily be kept in a small run with a four-feet high fence. The hens are good sitters and mothers. The chickens are hardy and grow fast, being ready for the table in from four to six months. Some birds of this breed grow to immense size and weight; cocks should weigh from 10 to 12 lbs., and hens from 7 to 10 lbs. Several cocks have weighed from 17½ to 18½ lbs.

They are very handsome birds, majestic in appearance, having heavily-feathered legs, though less so than Cochins.



PAIR OF BLACK LANGSHANS.

Fig. 14.

There are two varieties of Brahmas—Light and Dark. The outward appearance of both is similar in everything but colour of feathers. In America they have a third variety—the Buff. It is a newly-made variety and has not yet found favour in England. The Buff Brahma is in fact the Buff Langshan with a pea-comb. The Buffs are very superior birds, both for laying and table.

The Brahma should have a small, neat head, small pea-comb, and deep, massive body. The back should be of medium length and broad; breast broad and forward; and the saddle should rise to the tail. The tail should be rather upright and spread out like a fan, but the sickle should be an inch or two longer than the tail. The beak should be strong, curved and yellow or dark. The comb—the smaller the better—should consist of three serrated ridges, the central ridge being the largest, and unite at the pike and curve backwards. The ear-lobes should be bright red and round; the wattles bright red, long, and pendant. The neck should be curved, giving grace to carriage. The hackle should be flowing and abundant, increasing in bulk from the point nearest the head, and fall over the back. The wings should be small and the points well tucked away under the saddle feathers of the cock, and under the fluff of the hen. The feathers of the back and thigh should be abundant in the hen. The leg should be rather short and of light or dark yellow colour, feathered to the tip of the middle toe. The legs should be strong and well formed. The Brahma is square rather than lumpy, and

of sprightly and active habits, much more so than the Cochin.

A Cochiny Brahma is decidedly objectionable. The best birds have a very gamy look about them, and are somewhat hard in feather.

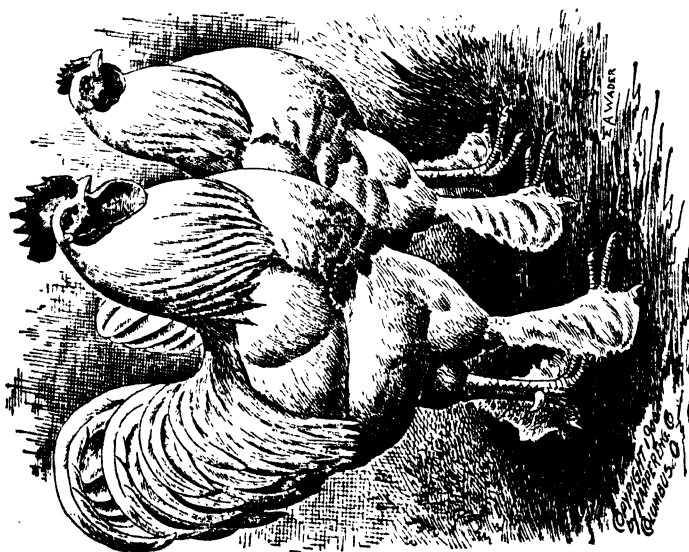
In India birds heavily feathered on the legs are at a disadvantage. They suffer much from wet and damp during the rains and from heavy dews. Moderately feathered birds are to be preferred in India. I very much prefer birds scantily feathered in the legs.

The tendency of all birds bred in the plains of India is to have less feather and fluff.

Brahma chickens are hardy and grow rapidly. If kept in a run and fed properly and protected from the sun and rain, they do very well.

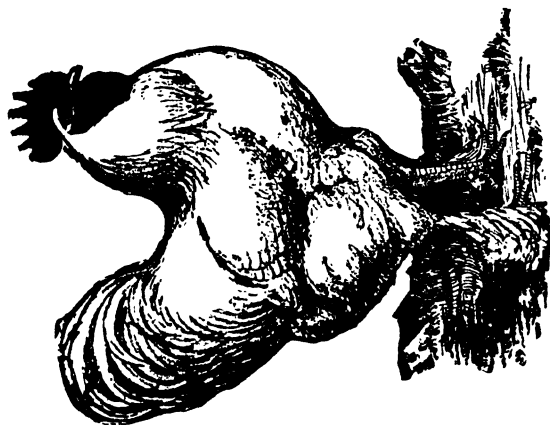
The plumage of the Light Brahma should be mainly white, the correct shade being pure white. The flight feathers, the neck-hackle and the saddle should be black, with an edging of white to each feather. Black feathers should be interspersed in the legs, while the tail and tail coverts should be principally black, some feathers being striped with white. The fluff should not be dark. There are specimens of pure white Brahmas. But those with black markings are preferred and are considered the best at exhibitions. The pure white birds are exceptionally handsome.

In Dark Brahmas the predominating colour should be black. The head, in both the cock and hen, should be white



PAIR OF BUFF LANGSHANS.

Fig. 15.



WHITE LANGSHAN COCK.

Fig. 16.

and the neck-hackle white, striped with black. The primary feathers in the wing should be black bordered with white. The breast and tail of the cock should be black, the back white, and other parts of the body chiefly black, with a little white mingled among it. In the hen the ground-colour of the whole plumage, except the head and neck, should be dark grey, and each feather pencilled with metallic black. The fluff should be black. Some hens are of a lighter grey with dark grey pencilling. The lustrous bar on the wing of the cock should be green-black.

Light Brahmas are considered better layers than the Dark ones, but Dark Brahmas attain to a greater size than Light ones. In judging Brahmas, colour, size, shape, feathers, and conditions must be taken into consideration. In breeding Brahmas, the first and most important point is the selection of the birds to be bred from. Both the males and females should be as perfect as possible, and should be descended for as many generations as possible from only first-class stock. In order to acquire a correct knowledge of the standard of perfection, the reader should study "The Illustrated Book of Poultry" by L. Wright. My illustrations give a very correct idea of what good Brahmas should be.

The Brahma is supposed to have originated in India, but now it is largely bred in Europe and America. The best birds are imported from England and America. The American Brahmas are better layers and table birds than those bred in England. English breeders have gone in too

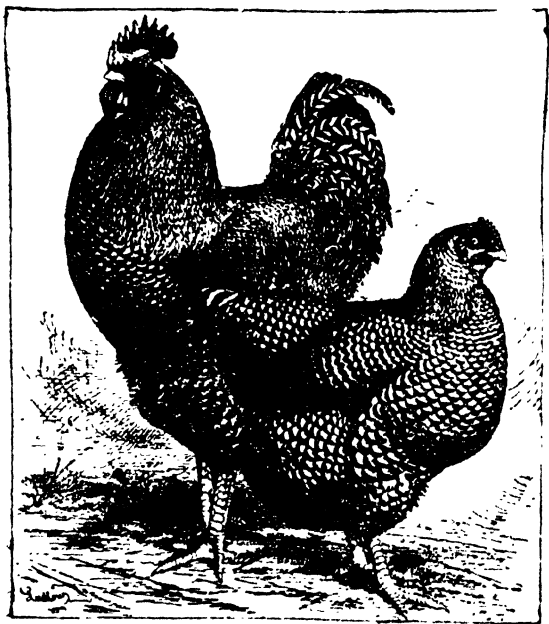
much for fancy points and heavy feathering, and sacrificed useful qualities. I believe the Brahma originated from a cross between the Cochin and the Malay fowl. It is now an established breed and has all the good qualities of both the Cochin and Malay. These birds are now bred in India, and the breed is rapidly spreading over the country. Ordinary birds will sell for two or three rupees each. Good stock birds can be had from twenty-five to fifty rupees per trio—a cock and two hens. Imported birds cost more. Some exhibition specimens have been sold for as much as £40 and £50 each.

A cross between the Brahma and the large Chittagong or Indian Game produces very good birds.

2. COCHIN.—The Cochin somewhat resembles the Brahma in shape and general appearance, but is rounder and more fluffy. The hens are fairly good layers, and good sitters and mothers, but are very clumsy and apt to break their eggs and crush their chickens. They are very quiet and tame, and can be kept in a small run enclosed with a three-foot fence. They are not so sprightly and active as the Brahmas. They are great favourites with many people, and are essentially the fanciers' fowl.

The chickens are hardy and easily reared, but should be kept in moderate-sized runs, and protected from the sun and rain. They do best when kept separate from other chickens. Cochin chickens need extra animal food and a larger quantity of food than ~~chicould be~~ any other breed.

.nd w'



PAIR OF BARRED PLYMOUTH ROCKS, ENGLISH TYPE.
Fig. 17.

Cochins are not very good table fowls ; their flesh is rather coarse after they are six months old ; but their eggs are very rich, and usually of a fair size. When crossed with the Chittagong, Game, Sussex or Dorking, they produce good table fowls and fair layers.

They grow to a great size. The cocks should weigh from 8 to 11 lbs., and the hens from 7 to 9 lbs.

The comb of both the cock and hen should be single, small, and erect ; the head small and neat ; the ear-lobes red ; the eyes red, dark or yellow ; the neck rather short ; and the hackle flowing widely over a short and broad back, which should rise at once into a broad saddle in the cock and an ample cushion in the hen : the breast should be broad, deep, and full ; the tail of the cock and hen should be as small, low and full as possible, with very little quill in it ; the wings should be small and deeply tucked in between the cushion or saddle above and the fluff below ; the legs should be short, thick, yellow in colour, and heavily feathered. Some birds have very few feathers on the feet. In England the Cochin has been bred to great perfection in colour and shape, but their good laying and table qualities have been sacrificed for exhibition points.

There are five leading varieties of Cochins : the Buff, Partridge, Cuckoo, White, and Black. The Buff and the White are the handsomest.

Buff.—The plumage of the Buffs may vary in shade from bright lemon to deep cinnamon. The hen should be the same shade all over ; the hackle, saddle feathers and wing bar of the

cock may be a little darker than the rest of the body ; a very small amount of black may be allowed in the tail and flight feathers, but none on the hackle or saddle ; neither should any white be seen in the tail, wing or other part of the body.

Partridge.—The breast, underpart of the body, thighs and tail of the cock should be black ; his hackle and saddle should be golden, with a black stripe down the centre of each feather ; he should have a rich red back and bar on the wings. The plumage of the hen should be light-brown, and the feathers closely and uniformly pencilled a darker brown ; her hackle should be deep yellow.

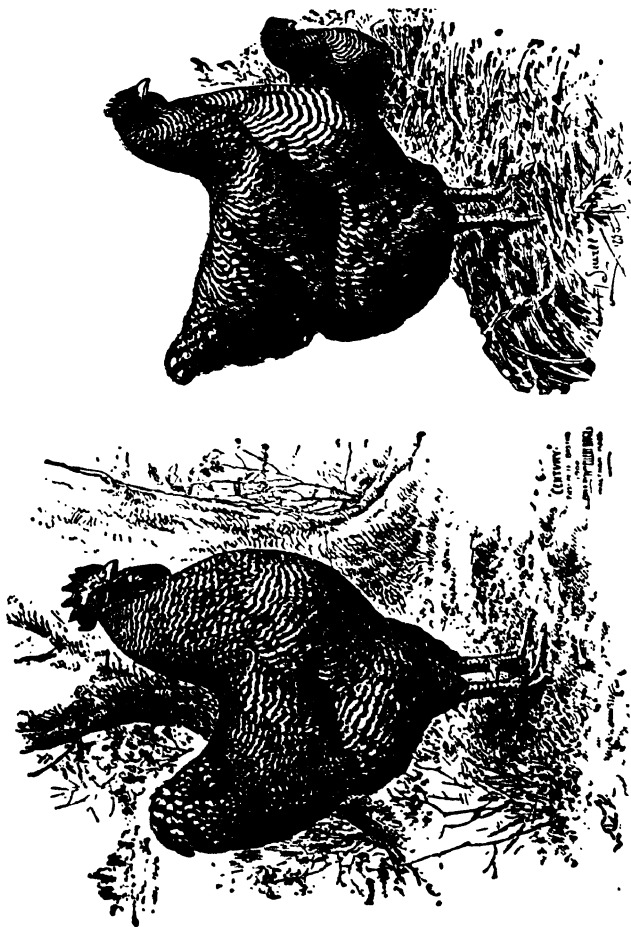
Cuckoo.—The plumage of the Cuckoo is a light bluish grey, barred across with lines of darker shade, like the Barred Rock.

White.—The plumage of the White Cochin must be pure glossy white all over, with no feather of another colour.

Black.—Black Cochins must be of a glossy greenish-black all over without a coloured feather.

*Silkie*s.—There is a breed of silky Cochins. Many years ago some very fine birds of this variety were imported by a gentleman in Calcutta. They were called “Cochin-China fowls” and were large handsome birds, buff and white in colour.

If a person desires to breed prize birds, he must acquire a correct knowledge of the standard of perfection, and in order to do this he must carefully study “The Illustrated Book of Poultry,” by L. Wright. My illustrations give a very correct idea of what Cochins should be.



BARRED PLYMOUTH ROCKS, AMERICAN TYPE.

Fig. 18.

The Cochin is a China bird, but is largely bred in Europe and America. Ordinary birds will sell for from two to three rupees each. Good stock birds sell for from twenty-five to fifty rupees per trio—a cock and two hens. Imported birds cost more. Exhibition specimens have been sold for from £20 to £40 each.

3. LANGSHAN.—The Langshan is a very handsome and useful bird. It is one of the best all-round fowl to be found. The hen is a good layer, and splendid sitter and mother. A good strain of this breed cannot be excelled by any other breed as layers. These birds are very tame, but have longer wings than either the Brahma or Cochin, and need a fence five feet high to keep them in. They need large runs and plenty of exercise.

There are four varieties of this breed—the Black, the Buff, the White, and the Blue. The Black is the pure original breed. The White is a sport from the Black. The Buff and Blue are manufactured varieties. The plumage of the Black variety should be black throughout with a green or purple sheen. A dull black is objectionable. The plumage of the Buff should be like that of the Buff Cochin; that of the White pure white throughout, and that of the Blue should be slate blue.

The Langshan carries abundance of flesh of good quality and flavour, and is unrivalled as a layer of rich dark-shelled eggs. The cock should have a single and medium-sized comb—the hen a single and rather small comb, though rose combs and tufts on the head are occasionally seen in

both cocks and hens ; the comb of both the cock and hen should be erect ; the breast should be broad and full and prominent ; the carriage upright ; neck arched ; legs of moderate length, dark coloured, and scantily feathered, the tail full and carried rather high ; they should not have much fluff ; the skin should be white. The cock should weigh from 9 to 11 lbs., and the hen from 7 to 9 lbs.

These birds will thrive well in India, and are very hardy if kept in dry, shady and properly ventilated places, and given plenty of liberty, but they will not stand wet and damp or exposure to the sun, and will not thrive in close confinement.

The chickens are hardy as regards all conditions except damp, sharp cold winds, and close confinement. They grow fast, but do not fledge very quickly. They cannot stand pampering ; they must be allowed to run with their mother, and scratch for some of their food. Langshan chickens should be kept by themselves and not mixed up with those of other breeds. They need large runs and a great deal of liberty, and some animal food.

The chickens of the black variety, when first hatched, are very peculiar. They are covered with black down, and the head, face, and breast are a mixture of black, white, and different shades of canary colour. These shades are not distributed according to rule—in some the light predominates, in others the black. In some of both sexes the white feathers are retained until they are four or six months old, when the white is replaced by perfectly glossy black

feathers. Some have pinkish and some have dark legs, but the bottom of the feet are nearly always pinkish white. They should have dark or hazel eyes.

The Langshan is a China bird, but is now bred to perfection in England and America. My illustrations give very correct ideas of the breed.

Good stock birds will sell from rupees twenty-five to rupees fifty a trio—a cock and two hens. Imported birds will cost double the above price. Exhibition birds will cost a great deal more. Ordinary birds can be bought for two and three rupees each.

4. Rock.—Rocks are very handsome and useful birds. They have plenty of good-flavoured flesh, and are good layers. They are capital sitters and mothers, and are quiet and tame. They are hardy, and can be kept within a five-feet high fence in rather large runs. The chickens are hardy and mature early. These birds are sometimes bred to a great size, but, as a rule, cocks should weigh from 8 to 11 lbs., and hens from 7 to 9 lbs.

The comb should be single and small, but there are some with rose combs; the beak yellow; the neck curved back and broad; the breast very broad; the wings well tucked up; the tail short and full; the legs rather short, stout, clean, and yellow; the birds should be compact and square in shape.

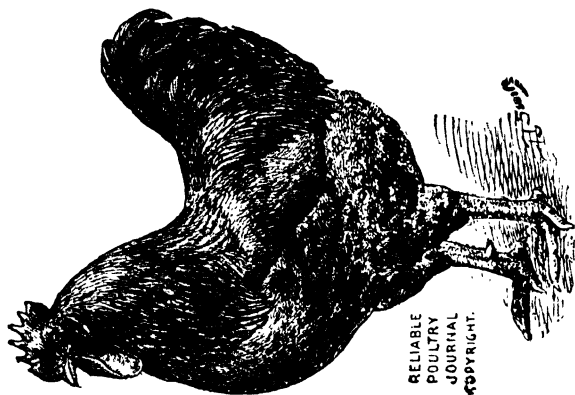
There are four varieties of this breed—the Barred or Cuckoo, Buff, Black, and White; but the Barred and White are considered the best. American breeders are evolving

some new varieties of this breed—the difference being in colour only. All these varieties are alike in everything but the colour of their plumage. The plumage of the Barred should be light-grey or steel-grey, and each feather striped with bars of bluish black; there should be no black, white, red or yellow feather in the plumage. The White ones should be pure white with yellow beaks and legs. The White ones are very large and handsome birds and good layers.

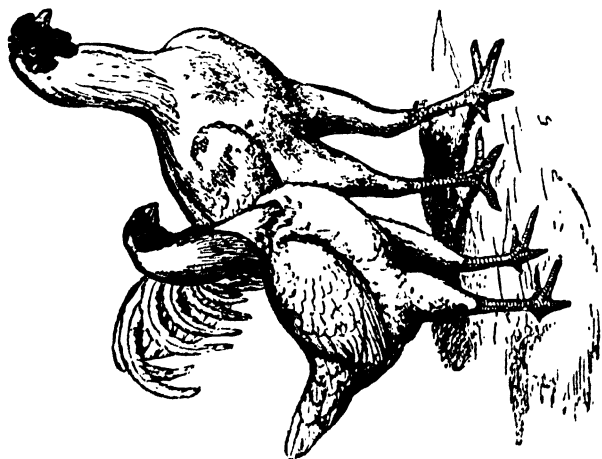
It is very difficult to breed the Barred to perfection in colour. Some will come very light, almost white; others will come dark, almost black. The White and Buff are bred more easily. The only way to prevent the Barred Rocks from coming too light or too dark is to mate the breeding stock properly. If the hens are too light in colour, a cock should be selected that is rather dark, or if the hens be too dark, a light cock should be selected.

The Rock is an American breed, produced by crossing their Dominique with the Black Langshan and the Malay or Chittagong. Some of the birds still come with a few feathers on the legs, and some with rose or pea-combs. My illustrations give very true pictures of these birds. Some fine specimens are found in India. Good stock birds will sell for from twenty-five to fifty rupees per trio—one cock and two hens. Imported birds will cost more.

5. WYANDOTTE.—The Wyandotte is a good breed of fowls. They are good table birds and layers. They are very good sitters and mothers, and are very hardy when



BUFF ORPINGTON COCK.
Fig. 20.



CHITTAGONG OR MALAY FOWLS.
Fig. 19.

mature. The average weight of the cock is between 7 and 9 lbs., and that of the hen between 5 and 7 lbs.

The comb must be rose, with a good spike, and closely fitting to the head ; the beak should be yellow ; the breast deep and broad ; the legs rather short, of a bright yellow colour, and free from feathers. In shape it resembles the Rock.

There are now five principal varieties of Wyandottes : the Silver Laced, the Gold Laced, the White, the Columbian, and the Buff. There are also some new varieties lately brought out—the Buff Laced, the Partridge, the Black, the Cuckoo, the Spangled and the Blue. The White ones are the prettiest and the best all-round birds. The other varieties also are very handsome birds. The White Wyandotte is an excellent layer of large tinted eggs. In laying contests they have often beaten the Leghorn. Some of the Wyandottes still come with single combs and feathers on the legs. Careful breeding will remedy these defects in a few years.

The plumage of the Silver Laced should be black striped or laced with silvery-white ; the tail black and full ; the outer edge of the wing primaries white.

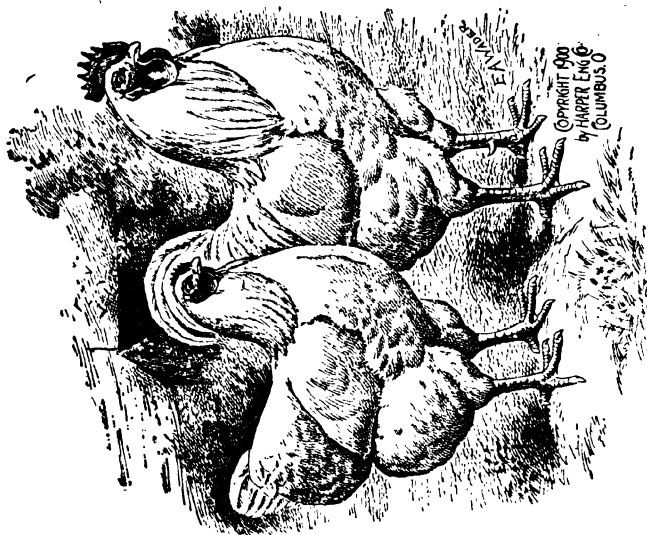
The Columbian should be like the Light Bhrahma in colour. It is a large bird and good layer.

The Black, Buff, and White should be self-coloured. The Gold Laced should be black laced with bright yellow. The Partridge should be coloured like the Partridge Cochin.

The Wyandotte is an American breed, made from a cross between the Brahma, Silver Laced Hamburg, and the Chittagong or Indian Game. For the first month or so the chickens need extra care, as I have found them rather delicate. They cannot stand wet, damp and strong winds and should be protected from the hot sun. They do better when they are given to a special hen to bring up and are not mixed with other chickens. My illustrations are very correct pictures of this breed. Ordinary birds will sell for from two to four rupees each. Good stock birds will sell for from twenty-five to fifty rupees per trio—one cock and two hens. Exhibition birds cost more.

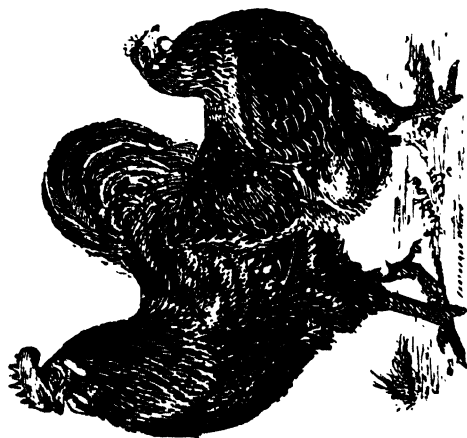
6. HOUDAN.—The Houdans are useful birds. They have plenty of good flesh on them, and are capital layers, but are not near as good all-round birds as the Wyandotte, Langshan, or Orpington. They are fairly hardy on dry soil and moderate climate, but will not thrive in Bengal, Assam, or where the rainfall is heavy. They are a non-sitting breed. The cocks should weigh from 5 to 7 lbs. and the hens from 4 to 5 lbs.

The comb must be leaf-shaped, and above it a large crest; the crest must be large, arched, full in the centre and falling over the sides; the beard must be very full, and the wattles fairly long and thin; the face wattle red; the nostrils arched; the beak black; the hackle full; the breast broad and full; back straight; the wings carried well up; the tail full, high and nearly erect; sickle black and white; the legs thin and nearly white; the thigh short and thick;



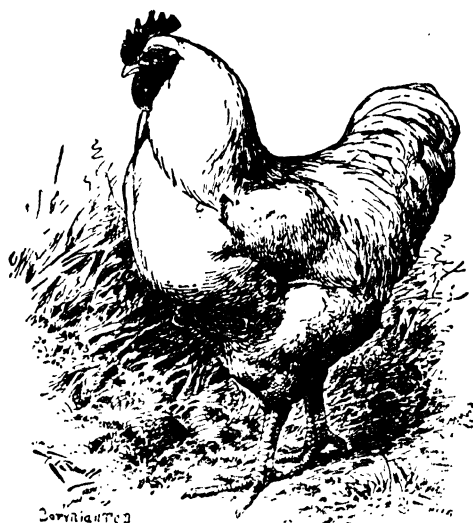
PAIR OF WHITE ORPINGTONS.

Fig. 22.



PAIR OF BLACK ORPINGTONS.

Fig. 21.



WHITE ORPINGTON COCK.

Fig. 23.

they always have a distinctly defined fifth toe. Their plumage should be black and white. The black must be of an olive-green tint, and the white evenly spangled all over the body.

I would not advise any one to keep the Houdan in its pure state. When crossed with the Cochin, Langshan, Brahma or Chittagong they produce very fair birds for the table, and good layers.

The Houdan is a French breed. Good stock birds should sell for from twenty to thirty rupees per trio—one cock and two hens.

7. MALAY OR CHITTAGONG.—These birds are called Malay, because they are natives of the Malay Peninsula, and Chittagong, because they are largely bred in Chittagong. These fowls are also called “Deang fowls” as the best specimens are bred in a place in Chittagong called “Deang.” I am told they can also be got in Bodalpara and Anwara, in Chittagong.

They are very large birds ; the cocks sometimes measure two feet six inches from beak to toe, and weigh from 8 to 10 lbs. ; the hens weigh from 6 to 9 lbs.

The flesh of the Chittagong fowl is excellent. The hens lay well, but are not very good mothers on account of their quarrelsome nature ; but if each hen is kept alone with her chickens, she will do splendidly and protect them from all intruders. Adult birds are very hardy, but do not bear confinement well. They do best when given a free range. They are very quarrelsome, and when kept in confinement

need a high fence to keep them in. The chickens for the first month are not very hardy, and need much care ; but they become very strong when they grow to be about three months old. The chickens will not stand confinement and pampering. If given their liberty from the second or third day after they are hatched, fed judiciously, and kept out of damp and wet, they will do very well. They need some extra animal food. The best time to raise Chittagong chickens is February and March, and from July to September, when there is plenty of green grass and animal food about the place. Chittagongs grow rapidly and make excellent birds for the table. The chickens should be reared by themselves, and not mixed with chickens of other breeds.

The Chittagong should have a small pea-comb, like a soft lump covered with small warts ; the head and beak should be long ; the beak yellow ; the wattles very small and red, in the hen hardly visible ; the ear-lobes small, red, sometimes with a little white ; the eyes white or light yellow ; eyebrows prominent and overhanging the eyes, making the head look very broad ; the neck long ; the breast broad and deep ; the carriage very upright ; broad shoulders ; slightly narrow loins ; the wings carried high and projecting at the shoulders ; the back sloping gradually to the tail ; the tail small and full ; in the cock it should droop ; the legs yellow, straight, long and strong, without feathers ; the plumage very close, firm, short, and glossy ; the feathers narrow.

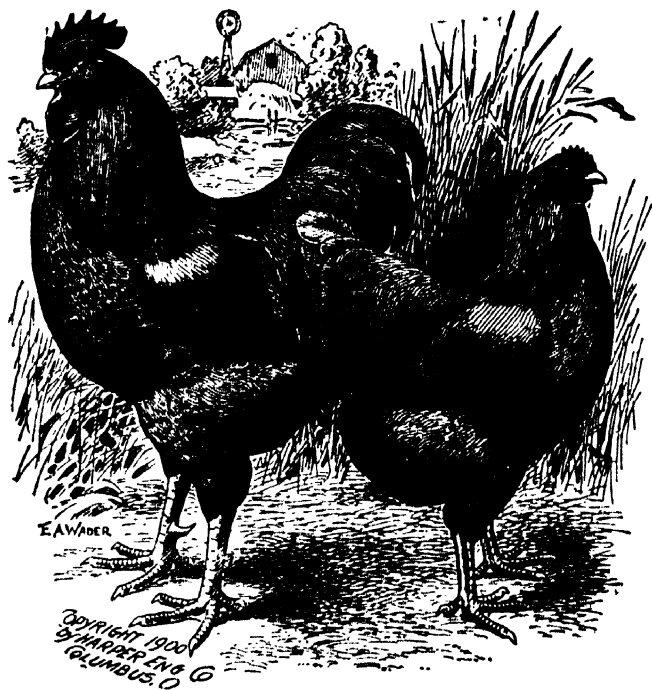
There is no fixed standard of colour for this breed. Good birds will be found in all colours. The natives of India have



WHITE ORPINGTON HEN.

Fig. 24.

Copyright J. B. Nodder.



PAIR OF BUFF ORPINGTONS.

Fig. 25.

no proper idea about scientific breeding. The Buff, White, Black, Dark-Brown, and Grey are the recognised varieties, but the Buff or Light Yellow is considered the best. It will take years of most careful breeding to get these birds to breed true to colour.

Bufs.—The cocks should be buff or golden, with bright yellow hackle and saddle ; there should be no black or white feather about the neck, hackle, or back ; the tail and wing primaries should be ash-grey or white tipped with green, the sickle ash-grey or black with yellow lacing, the coverts ash-grey or black with yellow border. The hen should be buff or light yellow : the back of the neck, hackle and smaller feathers in the tail may have some ash-grey feathers ; the tail and wing primaries should be ash-grey or white, a little black in the tail and primaries is allowable. My illustrations give a very correct outline of the shape and form of the birds.

The White ones should be pure white all over with yellow legs and beak. The Greys should be in colour like the Light or Dark Brahma.

Ordinary birds sell for from one rupee eight annas to two rupees each. Good stock birds will sell for from ten to fifteen rupees per trio—one cock and two hens.

8. **ASEEL OR INDIAN GAME.**—Aseel means real, true ; and the Aseel fowl is supposed to be the real pure Game. It is of all fowls the best table bird ; its flesh is peculiarly well-flavoured, and there is plenty of it.

Aseels are not very good layers, but they lay large and rich eggs. They are good sitters and fairly good mothers. They

require a certain amount of liberty, and will not thrive well in confinement. They are intensely pugnacious, and on this account, are hard to keep. The chickens are rather delicate, and need great care and plenty of animal food and perfect liberty. They should not be kept with chickens of other breeds.

In-breeding has greatly injured this breed in both size, constitution and laying qualities. The birds one sees in the bazaars in Calcutta, Allahabad, Lucknow and other Indian cities, though called Aseel, are nothing but cross-breeds between the real Indian Game and the common country fowl. This cross is resorted to in order to lighten the weight of the fighting cocks and make them more active. The real Game fowl is a large noble-looking bird. The best specimens are now found in Hyderabad and Mysore, where they are bred to a great size.

The cocks should weigh from 9 to 10 lbs., and the hens from 7 to 8 lbs.

The comb must be small and pea-shaped; face long and somewhat slender; heavy eyebrows; thick and long neck; hard and close-feathered; very broad breast; very upright carriage; small and drooping tail. In appearance they somewhat resemble the Chittagong, but have shorter legs and are more round and compact.

The colour is black, white, duck-wing, black and red, and mottled. The pure white are the handsomest birds.

Some good specimens are to be found in Chittagong near and around Cox's Bazaar.

No bird can equal the pure Indian Game for putting size and stamina into other breeds.

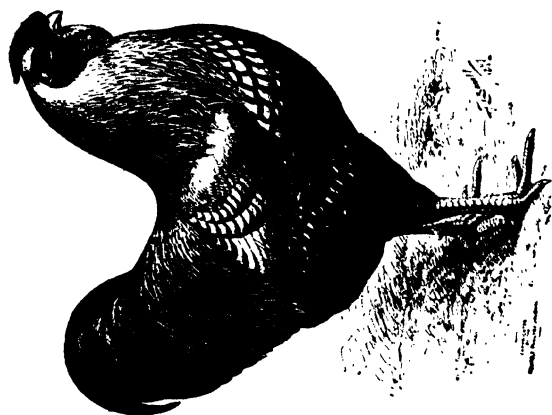
These birds are called the *Kullam* in Bombay and some parts of India. The Indian Game is bred to perfection in England, America and Australia.

When crossed with the Cochín, Brahma, Orpington and Langshan they produce very excellent table birds.

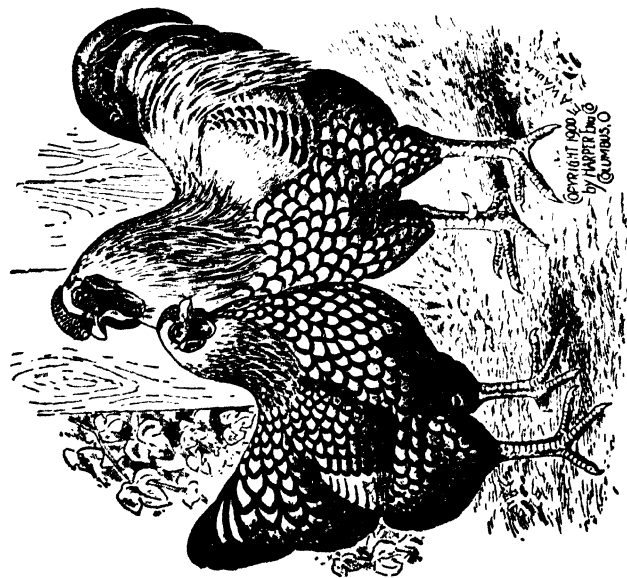
Ordinary birds will sell in the Bazaars for from two to five rupees each. Good stock birds sell for from thirty to one hundred rupees per trio—one cock and two hens. Some choice specimens have been sold for 500 rupees each.

9. GHAGUS.—The Ghagus is a peculiar Indian breed. In shape and appearance they are very much like the Faverolle, but without feathers on the legs. They are good table fowls, and fair layers. They are hardy, but will not bear confinement. They are good sitters and mothers.

The comb is either single or pea and small; the wattles and ear-lobes small; neck thick; throat loose and baggy; some have whiskers and beards; the body large and rather square; the legs rather long, smoky-yellow or greenish; both the cocks and hens grow very large. They are of various colours—red, bay, brown, black and grey. I believe this breed was produced from a cross between the Malay or the Indian Game and the Brahma or Langshan and the Houdan. The Ghagus is becoming very scarce, and is not often seen now-a-days. The best specimens can be procured from the Gipsy Nomads who wander over India, specially in the Deccan, Mysore and Sind.



SILVER-LACED WYANDOTTE COCK.
Fig. 27.



PAIR OF SILVER-LACED WYANDOTTES.
Fig. 26.

Good birds can be had, when obtainable, for from six to ten rupees per trio—a cock and two hens.

10. ORPINGTON.—The Orpington is one of the best breeds produced in England. In 1886 that great poultryman, Mr. William Cook, of Orpington, England, originated them. The Orpington is a most useful bird—a good table bird and an excellent layer—two qualities that are very seldom found in any one breed.

There are now three distinct popular varieties of this breed—the Black, the Buff, and the White. The Black variety has been produced by crossing together the Barred Rock, the Black clean-legged Langshan, and the Black Minorca. It is very much like the Langshan in shape, size and laying and table qualities, but is without feathers on the legs, somewhat rounder in make and shorter in leg. The colour should be exactly that of the Black Langshan, *i.e.*, pure black with a glossy green or purple sheen.

The Buff Orpington has been produced by crossing the Buff Cochins, the Golden Hamburg and the coloured Dorking. There is also now Malay blood in it. The colour of the Buffs should be that of the Buff Cochins. In size, shape and useful qualities the Buffs are equal to the Blacks. The Buffs are considered better layers.

The Whites have been produced by crossing the White Rock, White Dorking, White Leghorn, and White Langshan or the White Surrey fowl.

There are also Blue, Speckled, and Red Orpingtons.



PAIR OF WHITE WYANDOTTES.
Fig. 28.

The White, Black and Buff are the most popular, and fetch the highest prices in England, America and Australia.

Orpingtons should have no feathers on the legs. They should have red faces and ear-lobes ; broad breasts, long breast-bones ; white flesh ; short legs, in the Buffs and Whites white or pink in colour ; tail carried well back and straight. Among all three varieties you will find single and rose combs. The comb should be of small size and evenly serrated and straight.

The Orpington is very much like the Rock or Langshan, and looks like a clean-legged Langshan with a tail between that of a Cochin and Langshan, and short in legs. Cocks should weigh from 9 to 11 lbs., and hens from 7 to 9 lbs. Many weigh much less and a few weigh more.

The chickens are hardy and grow fast, but need the same treatment as Langshan chickens.

Ordinary birds will sell for from two to five rupees each. Good stock birds can be had for from thirty to seventy-five rupees a trio—a cock and two hens. Some exhibition birds have been sold for as much as £150 each in England. Australia has made great strides in poultry-breeding. Some excellent Orpingtons have been imported from there by breeders in India.

My illustrations are very good pictures of these birds. There is really very little difference between the Buff Orpington and the Buff Rock, or the White Orpington and the White Rock. The chief difference is in the colour of the legs and skin. The Orpingtons have white skins and legs,



WHITE WYANDOTTE COCK.

Fig. 29.

(Copyright J. B. Nodder.)

and the Rocks have yellow, but the Orpingtons are shorter in legs and looser in feather than the Rocks.

11. **SILKIE.**—These curious and beautiful little fowls are remarkable for the colour of the skin and silky hair-like nature of the plumage. They are of Chinese origin. They are not profitable poultry in the ordinary sense, but make capital sitters for pheasant or partridge eggs and are good mothers. The head and beak small. Face dark purple. Comb a queer lumpy round rose comb, of dark purplish colour. Crest, full and round, not cockatoo shape. Wattles long, purplish. Ear-lobes purplish, tinged white. Body square, covered with silky fluffy feathers. Wings carried low. Legs shortish and bluish-black in colour; some have five toes, some only four. The fifth toe is a deformity that should be bred out. They are good eating in spite of the purple colour of the skin. Of all species of Bantams, the Silkie, to my mind, is the best. They are very hardy and easily reared. They need a great deal of liberty, and their chickens thrive best when allowed to run with their mother in a large yard or garden. Some of these birds have feathers on the legs. They should be either clean-legged or very scantily feathered, but never with vulture hocks. Good stock birds can be had in India from ten to fifteen rupees a trio—a cock and two hens.

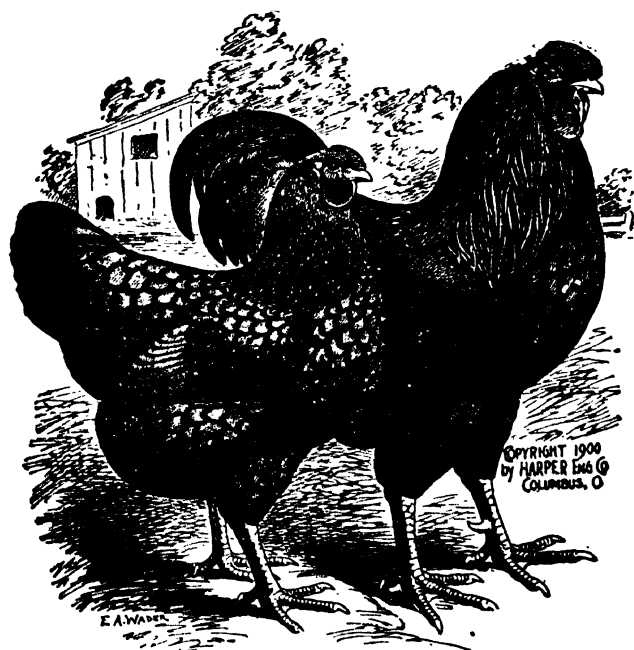
12. **DORKING.**—This is an old English breed. The general characteristics of the Dorking should be a large, deep square body, the breast-bone being long and prominent white skin, white legs and feet, five toes, the fifth being clearly

separated from the fourth and turning upwards, and white toe-nails. The fifth toe is a deformity and a disfigurement which should be bred out. The head large, wattles large and pendulous in the cock, not so large in the hen, and rounded. Eye full and bright ; comb single or rose in coloured Dorkings ; single in silver-greys (though fine rose silver-greys have been shown) ; rose in white or cuckoo.

The single comb should be upright in the cock ; in the hen it should fall on one side of the head. In the cock it should be thick, firm on the head, evenly serrated, free from side sprigs, semi-circular in outline seen from the side, and of fine texture. Thighs stout and covered by the plumage. Legs short and stout, and spurs carried inside. (Dorking hens and even pullets frequently have spurs of considerable size.) The general appearance should be massive and dignified.

Dorkings are inferior layers, but they lay large eggs, and are very good table birds. When crossed with the Brahma, Cochin, or Orpington they produce very good table birds. The chickens are very delicate and difficult to rear. Dorkings are very scarce in India. They fetch from five shillings to a pound each in England.

13. MINORCA.—The Minorcas are in many places known by the name of “ Red-faced Spanish,” and are the nearest, in shape and appearance, to the Black Spanish of all varieties of fowls. It is probable that the two races were originally one, and that the faces then were red, as the Minorcas now have them ; but the Spanish have been bred with white faces,



PAIR OF GOLDEN-LACED WYANDOTTES.

Fig. 30.

and spoiled by too fine breeding. The shape is like the Leghorn, but the comb is much larger, and there is the red face, the white ear-lobes, and the clean legs. There are two colours, the blacks and the whites, but the latter are very little seen. The metallic black plumage of the blacks makes them very handsome, and they are, for the same reason, very suitable for keeping in towns, or in such districts as are not over-clean, from the proximity of factories or works of any kind. As layers, Minorcas are one of the best small breeds we have at present ; they are capital foragers and small eaters. They are very good layers when given free range. They lay very large white eggs and a large number of them, but are not good table fowls. The chickens are delicate and difficult to rear in India. When the Minorca hen is crossed with a Langshan or Indian Game cock the chickens do better.

Good stock birds can be had for from fifteen to twenty-five rupees a trio—a cock and two hens.

14. **CAMPINE.**—The Campines are a breed of Belgium fowls of the Leghorn type. They are good layers of large white eggs, and carry a fair quantity of well-flavoured flesh. They are marked with black and white bars. The cocks weigh from 5 to 6 lbs., and the hens from 3 to 4 lbs.

15. **HAMBURG.**—Hamburgs are small fowls, but lay very well. There are a number of varieties of this breed. They are very much like the Leghorns in quality. They are no good for India.

16. **LEGHORN.**—Another most useful small breed is the Leghorn. It is a good layer of large white eggs. There

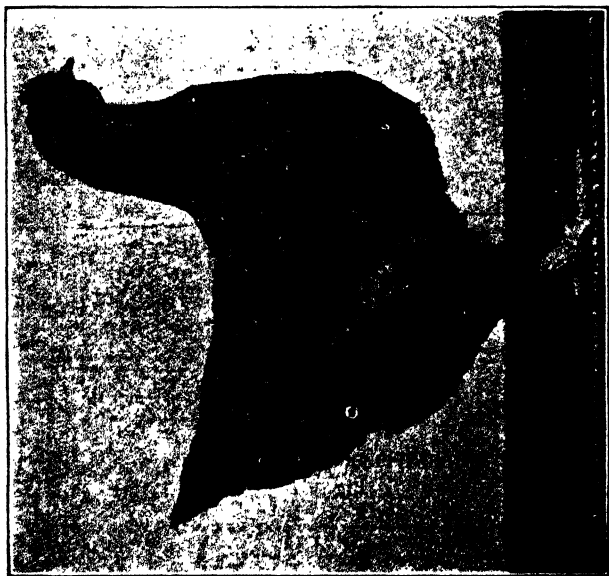


WHITE HYDERABAD GAME COCK.

Fig. 31.



LIGHT SUSSEX FOWLS.
Fig. 33.



RHODE ISLAND RED HEN.
(Copyright J. E. Hodder.) Fig. 32.

are several varieties of this breed, such as the white, brown, black, mottled, buff, and others. Of these, the white and brown are the most useful ; they are larger and lay larger eggs than the other varieties. I have lately seen some very fine large birds of the white variety imported from England, The Leghorn excels as a layer, but is not a good table bird, as it is not much larger than the ordinary country fowl. When crossed with the Indian Game, Chittagong or Langshan, they produce better table fowls, and very fair layers. The White Leghorn hens should be mated with White Chittagong cocks. The Buff or Brown Leghorn hens may also be crossed with Buff Chittagong or Langshan cocks.

The comb of the Leghorn cock should be single, large, erect, and evenly serrated, with five or six wedge-shaped spikes. The hen's comb should be similar in conformation to that of the cock, but carried drooping to one side of the head. There are also rose-combed Leghorns. I prefer the rose-combed variety. The face should be red, the lobes a pure white, and with all the varieties the legs should be yellow in colour. The best birds will weigh—cocks 6 lbs. and hens 4 lbs. The majority weigh much less.

Ordinary birds will sell for from two to three rupees each. Good stock birds can be had for from fifteen to twenty rupees a trio—a cock and two hens. I would not advise keeping Leghorns except for the production of eggs, but there are larger breeds that lay just as well.

17. ANCONA.—The Ancona is really a speckled variety of the Leghorn family.

18. **SUSSEX.**—The Sussex fowl is the oldest breed of English fowls now existing. It is sometimes called the Surrey fowl. This was one of the ancestors of the coloured Dorking. There are three recognised varieties of this breed—the Light, the Speckled, and the Red. There are also white and brown birds. The Light ones are marked like the Light Brahma, and are the favourite.

The Sussex fowl is hardy, both as a chicken and later on, and the hen is a very good layer and mother, but the commanding merit of this breed is as a table-fowl. For many years the newer breeds pushed the Sussex fowls into the background, but of late years it has again come to the front and is maintaining its place as one of the best all-round fowls. They are large square-built birds, with close plumage, single comb, short legs free from feathers, carriage erect and graceful. Cocks weigh 9 lbs., hens 7 lbs. There are not many in India. In England ordinary birds sell from 5 to 10 shillings each and really good ones for 12 to 21 shillings each.

19. **RHODE ISLAND RED.**—This fowl originated from a cross between the Brahma or Langshan and the Chittagong and the common farm-yard fowls of Rhode Island in America. The mixture of breeds still shows itself in the different types found among these fowls. Some are single-comb, some are rose-comb; some are like the Wyandotte, and some like the Rock in type. The prevailing colour is red, but there are also buff, white, and brown ones. Their value is about equal to the best White Wyandotte as layers, but not as good for the table as the Wyandotte or Rock.

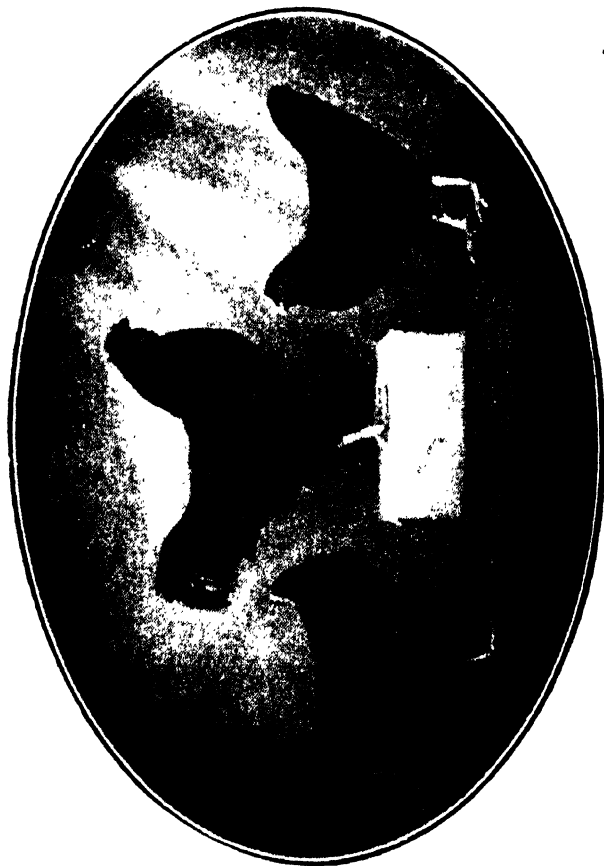
They are now standardised and are being bred extensively in England. Their chief value is as prolific layers of good-sized dark-shelled eggs. They are useful for general purpose fowls, and good for crossing with the common country fowls to increase the egg supply, and with the Chittagong for table purposes. •

The body should be long, broad, and deep, but not loosely feathered. Legs of medium length and clean. The cock's colour should be rich, brilliant red, with back and wing bows dark red; tail black; the hackle red; beak and legs yellow or red. The hen is lighter, of golden red. Cocks should weigh 8 to 9 lbs., and hens 6 to 7 lbs. Good stock birds can be had from Rs. 15 to Rs. 30 per trio.

20. **FAVEROLLE.**—The Faverolle is the most popular French breed. It is an outcome of crosses between the Brahma, the Dorking, and the Houdan. There are two recognised varieties—the salmon and the white. In both sexes the comb is single, but they have beards or muffs like the Houdan. They should not have crests. The body is broad, deep, and wide. The legs should be of medium size with scanty feathering. They have five toes like the Dorkings. They are good layers and table birds. The cocks should weigh from 7 to 8 lbs., and the hens from 6 to 7 lbs.

They are not expensive birds, and good birds can be had for from Rs. 15 to Rs. 30 per trio. They could be improved by careful crossing with the Chittagong or Indian Game.

21. **MALINES.**—The Concau de Malines is the leading variety of Belgian fowls. They are good table birds. Cocks



RHODE ISLAND REDS.

Fig. 34.

Copyright J. B. Nodder.)



FAVEROLLES.
Fig. 36.

Copyright Poultry World.)



MALINES.
Fig. 35.

weigh from 9 to 10 lbs., and hens from $6\frac{1}{2}$ to 8 lbs. In type they are like the Langshan. They are an outcome of crosses between the Brahma and the common fowls of the country. There are two colours—the white and the cuckoo. Good birds should be procured from England' for 7 to 12 shillings each.

IMPORTED POULTRY.—It often becomes necessary to import from other countries. We cannot in India always procure the birds we want. All the improved breeds have been made in England and America, and they have been very rare in India, until 20 or 25 years ago when some people imported the different varieties. Some years ago, when I wanted really good birds for breeding stock, I was obliged to import from England. It was impossible to procure them in India. The Brahmas, Cochins, Langshans, Rocks, Orpingtons, Leghorns, and Wyandottes I came across in India were either deteriorated or cross-bred birds, and not fit to breed from. The deterioration was caused by the owners being obliged to resort to continued in-breeding, because they could not procure birds of the same breed in India, and also to carelessness in mating. Some people, in order to preserve the stamina and size of their birds, were obliged to cross them with fowls of other large breeds. I was determined to have the best birds it was possible to get, so I sent home for them.

For some years I brought out some birds in the cold season. My experience with them has been very instructive.

(1) I find the journey from England to India very seriously affects the birds; some die on the voyage, some

live only a few days after their arrival in India, and nearly all die before the end of the first year. The close confinement in small coops and overfeeding during the long voyage injure the birds seriously. They are also exposed to the heat of the sun and the cold nights on the voyage and this kills them.

(2) The change of climate seriously affects them; they cannot endure the hot winds and the rainy season, or exposure to the sun. I lose a large number from apoplexy and cholera during the first year, notwithstanding every precaution.

(3) I get very few eggs from the imported birds; the few eggs they lay are either infertile or produce weak chickens.

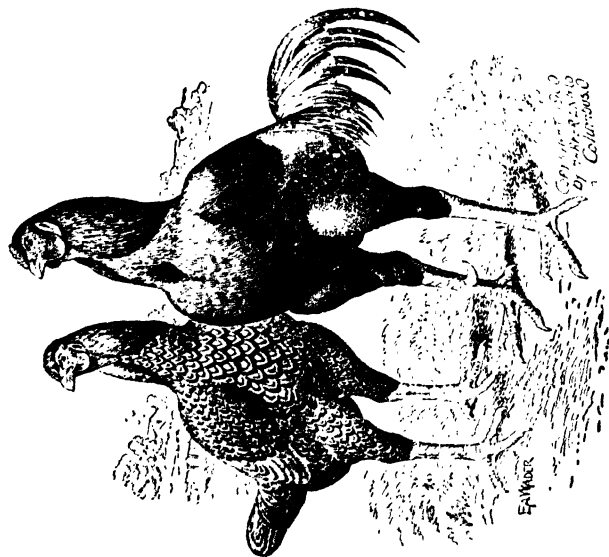
(4) Some that survive the first year do better the second season; their eggs are more fertile and produce stronger chickens. But some never lay more than a dozen eggs in twelve months.

(5) The birds I succeed in rearing from my imported stock do better than their parents. The cocks are stronger and more active, and the hens lay better, and the eggs produce better chickens.

(6) Cockerels and pullets between 8 and 9 months of age stand the voyage better and do better subsequently than older or younger birds imported.

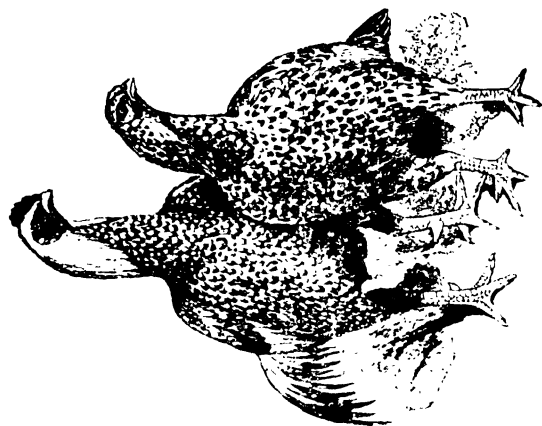
(7) It has taken me from three to five years to improve the birds and produce anything like what I want.

Success.—I clearly saw that if I desired to keep a good strain of fowls I would have to raise as many chickens as I



PAIR OF BLACK-RED INDIAN GAME.

Fig. 37.



PAIR OF NOTTLED INDIAN GAME.

Fig. 38.

could from my imported birds, and then go on breeding and perfecting, until I worked out defects and established the qualities I wanted.

I have, often heard it said that birds raised in India are not equal to birds imported from England. My experience contradicts this. The birds I have raised in India have been equally as good and very often far superior to birds I have procured from England. In size and colour of the breed they have been just as good. In stamina and laying and table qualities they have been even better than their imported parents.

The secret of my success has been not merely having pure-bred birds to start with, but carefully selecting, mating and breeding them.

An ounce of experience is worth more than a pound of theory. I have bred fowls for the past 50 years, and in these few years I have learned some things it is impossible to teach others, because they can be learned only by personal experience by persons who are willing to learn.

My advice to poultry-keepers is, keep on at it, study and work, work and study, read all the good books and papers you can get hold of, study your own birds, and work with them and improve and perfect them. You will not always be successful, but do not become discouraged. See where you have made a mistake. Try again, avoid your errors, and work for success. Experience will cost you some time and money; it will also cost thought and labour. You cannot procure experience without such expenditure. Are you

willing to pay the price ? Some people who say they have been breeding poultry for 40 years know as little now as they did 40 years ago. They have learned nothing. They have spent time and money it is true, but they did not think and work. Poultry-breeding needs thought and labour, study and work, just as much as the successful practice of anything in life needs study and work.

THE BEST BREED.—My experience teaches me that there is *no* best breed in fowls. I have often been asked, “ Which is the best breed for laying ? ” or “ Which is the best breed for table purposes ? ” These questions are very difficult to answer, and that for various reasons. Some birds lay more eggs than do some other birds, but the eggs are small ; some will lay large eggs, but not very many. Now, what do you mean by a good layer ? A hen that lays small and many eggs, or a hen that lays large and fewer eggs ? Then, again, all hens of the same breed will not lay the same number of eggs, nor will they lay eggs of the same size. I have had bad and good layers among all breeds. The Cochín is supposed to be the worst layer of all breeds, and the Houdan and Minorca the best layers. Yet I have had a Cochín hen lay as many as 56 eggs before clucking ; and I have had Houdan and Minorca hens that did not lay 30 eggs during the year, so it is quite impossible to say which breed is the best layer. It is not so much the breed as it is the special strain or family of the breed that proves good layers ; and this strain is made by careful thought and breeding. The same thing applies to birds for table purposes. The best breed for me is the breed

I like best, and I have worked longest with. The ideal fowl is the one that is beautiful to look at, will lay about 120 large eggs during the year, and will give a good account of itself when served up on the table. There are such fowls. You will not find many in the market, but you can make them at home if you want to do so. My Chittagongs have laid just as many eggs as my Houdans or Langshans, and my Brahmas have produced just as good table-fowls as the Game or Chittagong. They are what I have made them. They are the product of my money, time, thought and labour. They will do better next year, because I am still working with them. My ideal is not merely a fancy bird with beautiful feathers and nothing else. I want a bird as large as possible, handsome or even beautiful, carrying plenty of meat and producing a good number of eggs. And such birds I have had among my Brahmas, Cochins, Langshans, Rocks, Orpingtons, Wyandottes, Rhode Island Reds and Chittagongs.

I have not succeeded as well with other breeds because I have not been able to give sufficient time, thought and labour to them.

SIZE.—The size of birds and eggs is a subject of some interest. Some very small birds are found among the large breeds, and some small breeds will produce fairly large birds. There are Bantams among Brahmas, Cochins, Rocks, Langshans, Game, and Chittagongs. Some of these Bantams—miniatures of the larger breeds—will weigh only a few ounces when full grown. The Houdan, Minorca, and Leghorn are small birds, but some of them will weigh from 7 to 8 lbs.

The size of a fowl is entirely a matter of breeding and rearing. You can produce Bantams from the large fowls, and you can produce large fowls from Bantams : you can do so if you will only give thought and labour to it.

The size of the eggs also is a matter of interest. The Cochins is supposed to lay small eggs, very few weighing more than $1\frac{1}{2}$ ounces. The Brahma also is supposed to lay medium sized eggs. The Langshan, Wyandotte, Orpington and Rock are supposed to lay eggs of good size, usually weighing 2 ounces. The Minorca, Houdan, and Leghorn are small birds, yet they are supposed to lay large eggs. The Chittagong is a large breed, but it lays a small egg. But I have had some Cochins, Brahmas and Chittagongs lay large eggs, weighing 2 ounces, and some Minorcas, Houdans, and Leghorns lay very small eggs, weighing from only 1 to $1\frac{1}{2}$ ounces.

Now the size of the egg also is not so much the question of the breed as it is of the strain. By proper selection, mating, breeding and rearing you can make a strain—the family of the breed you have—lay large eggs.

In England, America and Australia eggs weighing 2 ounces are considered to be of the proper weight. You can make your fowls lay large eggs, and you can also make them lay small eggs.

BUYING EGGS AND FOWLS.—I would much rather buy ordinary eggs from a yard where I know the fowls are properly selected, mated, and bred, than buy some grand-looking fowls from a yard where selection, mating, and breeding are neglected. A bird that carries off the first prize at a show

may be only the chance bird of a yard where selection, mating, and breeding are not done properly, and that bird cannot be expected to reproduce itself in its progeny. It will be practically useless as a breeder. The eggs procured from the yard of an experienced breeder will produce at least 10 per cent. of very superior chickens that will, in their turn, again produce some first-class birds. Every egg will not produce a bird of equal value. But where a certain quality is being bred for, that quality will be reproduced in some measure in a portion of the chickens raised from these eggs.

PURE-BRED OR CROSS-BRED.—All the breeds, such as the Brahma, Cochin, Langshan, Rock, Wyandotte, Orpington, Rhode Island Red, Houdan, and the innumerable variety of fowls found to-day are manufactured. I believe the Games and Chittagong are the oldest breeds. I can make any variety of fowls by careful selection and breeding. But others have spent a great deal of time, money, brains, and labour in producing the variety of breeds we now have, and it's no use my going over the same ground and trying to produce what has already been produced, so I am content to take some of the varieties already produced, and work on them and try to perfect them. I can get better results from what we call pure-bred birds than from birds that have been mixed up together. It may become necessary to put some foreign blood into a breed in order to improve certain points, but this should not be attempted by any person who is unacquainted with poultry culture. When two pure breeds are mixed together, the bad qualities of both parents are

more likely to predominate in the progeny than good qualities, and the further the mixing process goes on, the quicker the progeny will deteriorate.

EGG PRODUCTION AND FERTILITY.—The majority of fowls lay from 30 to 60 eggs a year. Sixty eggs for each hen is a high average. Some hens will lay as many as 120 eggs, and it is said some have laid 300 eggs in 12 months. Some people are now trying to make hens lay 365 eggs a year. My reader, you may not be surprised if some one tries to produce hens that will lay two eggs each day of the 365 in the year. I hear some hens are now doing this in America. Now-a-days hens are called laying machines. Well, some people may want laying machines, but I don't. When hens lay a large number of eggs, their eggs produce very few chickens. This excessive production weakens the germ and a very large percentage of the eggs prove infertile. If you want a large number of eggs, you must not want chickens. If you want chickens, you must be content with fewer eggs.

People are very exacting. They want 250 eggs from a hen, and they want 250 chickens from the 250 eggs. If a hen lays 200 eggs in 12 months and you raise fifty chickens from those eggs, you have done well. Large producers are kept not for breeding purposes, but for supplying eggs to the market. If I want a lot of strong, healthy, vigorous chickens, I select a good, large, healthy bird that will lay from 120 to 160 eggs in 12 months, and I will be satisfied if half the number of her eggs hatch. Some hens will lay only from 9 to 12 eggs, then become broody and begin to incubate their

eggs ; such hens will generally raise from 11 to 12 chickens from 13 eggs. They are satisfied with bringing up only three broods a year. That is what all hens do in their natural state. When they are civilised and educated to produce large numbers of eggs, the eggs are less fertile, and the chickens produced are less vigorous.

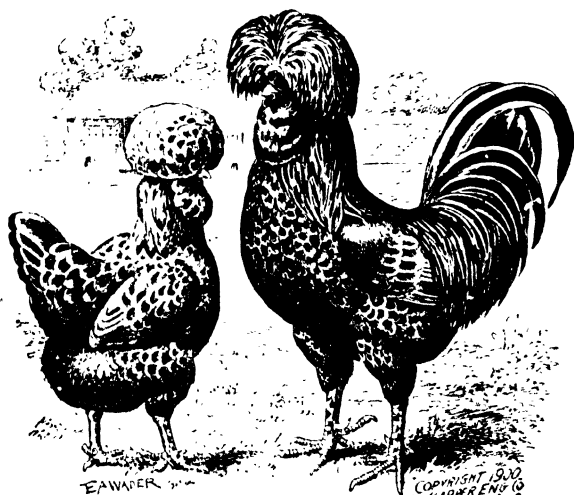
CHAPTER VII.

BREEDING.

IF permanent success in poultry-keeping is desired, systematic breeding must be carried on. It is only by carefully breeding from the best birds that the great improvement in our domestic poultry has been attained. I would advise every poultry-breeder to keep a copy of "The Illustrated Book of Poultry," by Lewes Wright. The new and revised edition of Mr. Wright's book should be obtained. Also procure all the books on Poultry in India. Those books may not give you any more information than you will obtain from this volume, but you will receive some benefit from the experience of other successful breeders.

Breeding one's own poultry is much cheaper than buying them. They not only cost less money, but the danger of infection caused by diseased imported birds is avoided. Then, again, one is always sure of the blood, or strain, as it is called, of the birds he breeds in his yard. The general rule is, "like will produce like," though this is not always absolutely true of every breed.

THE ART OF BREEDING is governed by a few rules which are simple and easy to understand; and these rules must



PAIR OF HOUDANS.

Fig. 39.

be faithfully observed if any degree of success is to be gained:—

1. Select only the largest and best formed birds of the breed to breed from.

2. Never breed from weakly, sickly, stunted, mismarked or deformed birds.

3. Always select the best layers to breed from.

4. Never breed from cocks or hens under a year old, or more than three-and-a-half years old. The best chickens are produced from hens two years old mated with cocks a year old, or hens a year old mated with cocks two years old.

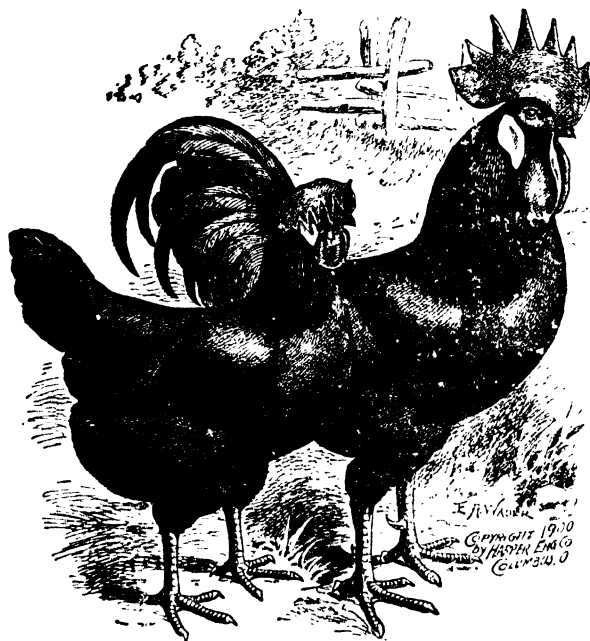
5. Never breed in—that is, the male bird should always be of a different family from the hens he is mated with, though of the same strain. Never breed from brother and sister. If the relationship be distant, the birds can be bred from with advantage.

6. To improve the breed, the hen must be mated with a cock that is superior to her. If the cock be inferior to the hen, the chickens will be inferior to their mother; but if the cock be superior to the hen, the chickens will be superior to their mother. An inferior cock will work ruin in a poultry-yard. It is much more economical to pay fifty rupees for a really good cock to mate with the breeding hens than to buy an ordinary bird for that purpose and pay five rupees for him. The cock must not only be a good one, but must be from good stock and properly bred. If he is not from a good strain or family, he will not produce good chickens.

7. To breed successfully, proper food and careful management are absolutely necessary.

THE PARENT'S INFLUENCE.—The male parent affects the external structure, shape, size and colour of the progeny and the female parent influences the internal structure—the constitution, temper, habits and egg-producing powers. This is especially true of pure-bred birds. All chickens from pure-bred parents will not come perfect in all points. Out of a dozen chickens probably only one or two will come up to anything like exhibition standard. Some will be defective in marking, some in size, some in shape, some in comb or leg. The Barred Rock and the Laced Wyandotte are difficult to breed up to standard perfection. They are not very old breeds and frequently throw back. Some of the Barred Rocks will come white, some black, some too light and some too dark. Some of the Laced Wyandottes will come with a little feather on the legs, or defective in marking, or with defective combs. The older breeds, such as the Cochin, Langshan and Brahma are easier to breed true, but even they frequently come with little or no feathers on the legs, and with defective combs. Perfection in any bird is the result of continuous care in selection and breeding for years.

STOCK BIRDS.—In selecting a cock for breeding purposes, it is necessary to see, first, that he is of a good size, has bone and plenty of flesh, not merely feathers, broad chest and erect carriage; second, that he has the right shape of his breed; third, that he has good colour; fourth, that he is active and



PAIR OF BLACK MINORCAS.

Fig. 40.

young, but not under a year old ; fifth, that he is perfectly healthy ; sixth, that he is of good parentage—pedigree ; seventh, that he has not been used too much and his powers exhausted. A pure-bred cock with these qualities will improve the birds bred in the poultry-yard.

In selecting a hen or pullet for breeding purposes, it is necessary to see, first, that she is of a good size, has bone and plenty of flesh, but is not too fat, is broad and deep in chest and erect in carriage ; second, that she has the right shape of her breed ; third, that she is of good colour ; fourth, that she is quiet and tame, active and young, but not under a year old ; fifth, that she is perfectly healthy and has moulted quickly and is in no way deformed ; sixth, that she comes on to lay early and lays a good number of large eggs ; seventh, that she is of the same breed as the cock, of good pedigree, and resembles him in colour. A pure-bred hen with the above-mentioned qualities, when mated with the cock described above, is sure to produce some first-class birds.

It must be borne in mind that while the quality of the hen only affects the quality of her own progeny, the quality of the cock affects the progeny of every hen in the pen with him. Not only the quality of the cock, but the quality of the progenitors of that cock, not for one only, but for many generations back, will affect the progeny of that cock. Hence no care or money is wasted if wisely spent on the selection of a really good cock for the breeding pen.

Rigid selection is the only means by which the stock can be improved. Every year the best hens and pullets

must be picked out of the stock, and mated with the best cockerels and cocks. The cock must always be of a different family from the hens he is mated with, though of the same strain or line. This should be done every year; and the defective and old birds either sold in the market or used for the table. If two or three separate pens of the same breed are kept, the cock of one pen can be mated to the pullets of the other pen, and the cockerels of one pen to the hens of the other pen. With three pens of the same breed, a judicious man need not go outside for fresh blood; he will have all the cocks and hens he wants for the most successful pedigree breeding for many years, and effectually avoid breeding with close relations. This method will insure a good and reliable stock of birds. In a properly managed yard, half the stock of birds will be bred each year, and a third of the old stock will be killed off or sold. A few surplus birds must be kept to fill the places of those that may have to be removed from the pens. Unless this is done, it will be impossible to keep up the efficiency of the stock. The cock used for breeding must, in every case, be a pure-bred one; a cross-bred cock must never be bred from.

PROPORTION BETWEEN COCKS AND HENS.—Very large cocks must not be mated with small hens, and very small cocks must not be mated to large hens. Both birds must be of proper proportions and as large as possible in the large breeds, and as small as possible in Bantams. When one bird is too large and the other too small, the eggs are infertile, and the small hens are seriously injured by the large heavy cocks.

NUMBER OF HENS TO A COCK.—Not more than from three to four hens should be given to a Brahma or Cochin cock ; the Rock, Langshan, Orpington and Game cock should have from five to six ; the Wyandotte and Rhode Island Red from six to eight ; but the Chittagong, Minorca and Leghorn need from seven to ten hens for each cock. As the hens finish laying and leave the run, others must be put in their place. Some cocks will take more hens than will other cocks of the same breed, and some cocks will not be able to serve half the usual number. The number of hens given to a cock depends upon the age and vitality of the male bird, and also the season of the year. Poultry generally begin to moult in July and August, and during July, August, September, and even October, the cock birds are not so active as they are from November to April. The excessive heat, during May and June is very trying and exhausting to some birds. The cocks and hens should be separated during the time of their moult, July to September.

Half the battle of rearing strong useful chicks lies with the parents, for the condition of the breeding stock, especially of the male bird, is of the utmost importance ; the birds must all be fully grown and in the pink of health and condition, neither too fat nor too lean. The best results are obtained when the male bird is removed from the breeding pen at the end of the season and kept by himself and well fed till he is wanted again. But this is not enough ; he must not be allowed, even during the breeding season, to remain for any length of time in the pen with the hens without a change.

Some breeders keep two cocks for each pen of from six to ten hens, changing the male bird every week, or perhaps every three or four days.

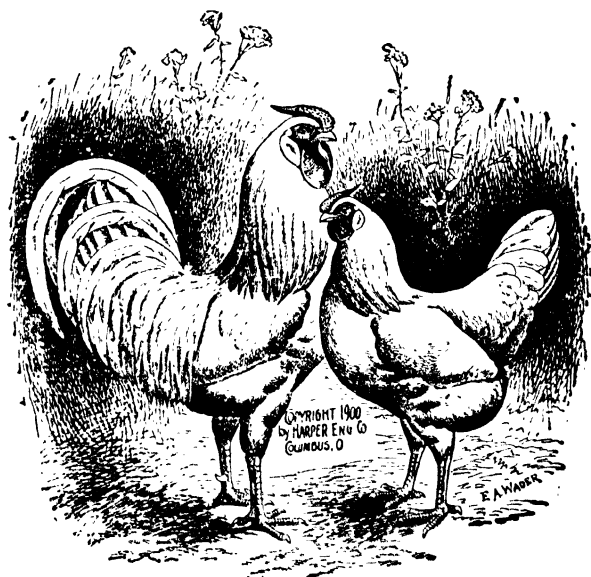
Too few hens are as great a cause of infertile eggs as too many, and the strain upon the hens is also very liable to cause them irreparable injury.

HOW TO MANAGE COCKERELS.—As a rule, cocks begin to run with the hens much before the time thy should. If cockerels are put with hens before they are one year old, they are stunted, and their progeny are not strong and large. Cockerels should be kept far away from hens and pullets in a separate run, shed and house, and properly fed and cared for, until they are a year old, when they should be mated to selected hens.

KEPT SEPARATE.—If more than one breed is kept, each breed must be kept separate, and on no account allowed to run together. They must have separate houses, sheds and runs. When different breeds are allowed to run together, all the birds are ruined and the progeny becomes worthless.

When a person has limited room and means, he should keep only one breed of fowls, and that a pure one. Keep a cock and from four to ten hens according to the breed. A few fowls can be easily managed, and will yield a great deal of pleasure and profit.

When the grounds are large, and the person can afford it, he should keep two or three separate pens of the same breed. I strongly advise people not to keep more than one breed of fowls. When two or more pens of the same breed



PAIR OF WHITE ROSE-COMB LEGHORNS.

Fig. 41.

are kept, and the chickens of the separate pens are not closely related to each other, the cocks of one lot may be mated with the pullets of another lot, and in-breeding thus avoided. But when all the fowls are allowed to run together, the cocks must be procured from elsewhere.

THE COLONY PLAN.--In a large run, enclosed with wire-netting, or in a garden or field, a colony of from twenty-one to thirty-three birds can be kept with very good results. The run should be at least from 300 to 400 feet long and 100 to 150 feet wide, with a house 10 feet by 15 feet in the centre, and a number of large trees around for shade. In such a run and house three cocks and from eighteen to thirty hens can be kept satisfactorily. Such a number of birds cannot be kept in a small run. If two cocks are kept with the hens in a small run, they will worry the hens and get to fighting. But when kept on free range or in a colony in a large run as mentioned above, three cocks can be kept together with the hens. When the grounds are large enough, the flock will, as a rule, split into as many portions as there are males, and each lot take to different parts of the run and live in peace. Before the cocks are put together in the pen, they should be kept together by themselves in a small pen and allowed to make friends. They must not be allowed to fight.

MATING FOR COLOUR is a very difficult subject to touch upon : it embraces such a large area that it is quite impossible to go fully into the subject. As buff seems to be the prevailing colour, we will just say a word or two about this popular tint, which has caused so much haggling and

unpleasantness in exhibition circles. As everybody knows, the great bugbear in breeds of this colour is the persistency with which the black feather makes its appearance in the tail ; we may breed from birds almost sound in colour, but the youngsters from them may show the black feather to an alarming extent. If I were mating up a pen of this colour, I would sooner select a good, *level*, deep-coloured cockerel, even if he did show a little black in the tail (I would also insist on the black feathers showing a tinge of buff in each one), than a so-called self-coloured bird of the “ wishy-washy ” type. I always deem it advisable in this colour to have the male bird a deeper and richer shade than the female. Very often the buff runs too light and produces white. In some varieties it is quite impossible to breed both males and females of good colour from the same pen.

CROSS-BREEDING.—Breeding cross-bred poultry needs skill, commonsense and knowledge of the characteristics of the different breeds. All crosses are not good. I have already mentioned which breeds mated together produce the best crosses. Cross-bred fowls should not be bred from ; they should be used for the table and for laying only. If they are bred from, their progeny will be sure to deteriorate. The first-cross is the best. By first-cross, I mean the progeny of a cock of pure breed and a hen of another pure breed. If the first-cross hens are bred from, they must be mated to another pure-bred cock of the same breed as their father. The cross-bred cockerels or cocks must never be used for breeding.

There is absolutely no sense in producing cross-breeds. The pure breeds are very much more satisfactory both as layers and table fowls, as well as for exhibition. Some one will say, "I don't want pure-bred exhibition fowls. I cannot afford to pay Rs. 25 for a trio. I want birds only for eggs and the use of the table." Be it so, pure-bred fowls will prove more economical in the end than scrubs. For instance, say, a good trio costs you Rs. 50, you get 300 eggs or even say 250 from the two hens. You set half the number and use the other half for the table. The 125 eggs may produce 60 chickens. Of this number 50 are reared. Out of the 50, you sell 10 for Rs. 10 or even 5 each, and you use 40 for the table. This is a great deal more than you could possibly get from the same number of common fowls.

CROWDING.—Another matter of very great importance is never to have too many fowls in one run or house. When fowls are crowded together, they will not lay well, and the eggs they do lay, if not infertile, will produce weak and sickly chickens; not only so, but the fowls will soon become sick and die. Fowls should never be kept in the same house and run with ducks, geese or turkeys. If they are, they will be utterly spoiled.

CARE AND FEED.—A very great deal depends upon the care given to fowls and the food they receive. You need never expect to get good birds without good food and proper care. The best breed will soon deteriorate if neglected or badly fed.

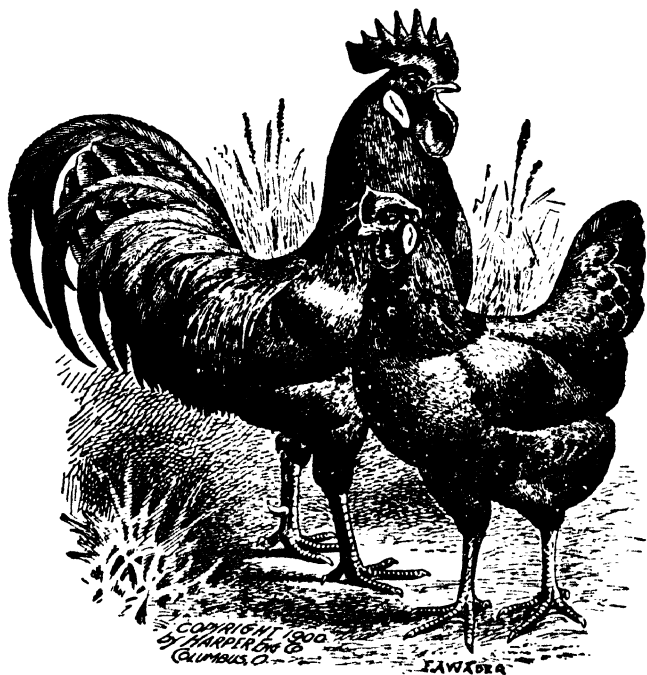
HOW TO KNOW THE BEST LAYERS.—It is sometimes difficult to know the best layers among the hens. Those

who keep only a few fowls and watch them closely can often distinguish the egg of each bird. But when many are kept this is impossible. It is always best to keep the hens from which you desire to breed separate from the common stock, and when this is done, it is not difficult to tell which of them are the best layers. An active, intelligent-looking bird, with a bright comb, will, as a rule, be a better layer than a dull, lazy-looking hen.

The safest method is to use trap nests or separate pens. This nest is so constructed that as soon as the hen enters it, the trap-door closes down and shuts the hen in. After she has laid her egg, you liberate her. By this means you can tell how many eggs each hen lays in the year.

HOW TO KNOW THE AGE OF BIRDS.—An experienced hand can tell an old fowl at a glance, but it is rather difficult to impart this knowledge to a beginner; for no one sign is infallible. In general, the legs of a young bird look delicate and smooth, its comb and wattles soft and fresh and its general outline, even in good condition, rather light and graceful; whilst an old one will have rather hard, horny-looking shanks, its comb and wattles look somewhat harder, drier and more “scurfy,” and its figure is well filled out. But many of these indications may be deceptive, especially as “dealers” have a way of making old birds look young. The only advice I can give a beginner is to use his own powers of observation, and try and detect the “old look.”

FAT HENS.—The breeding stock must never be allowed to become fat. When a hen begins to grow fat, she will begin



PAIR OF BUFF LECHORNS.

Fig. 42.

to reduce the number and size of her eggs. A very fat hen will not lay at all. A laying hen should be in good condition, not fat nor thin. When a hen is allowed to run light she will become ill and stop laying. Laying hens should be kept in a fair and hard condition. If the cock bird gets too fat, he will become dull and lazy, and will be useless in the pen.

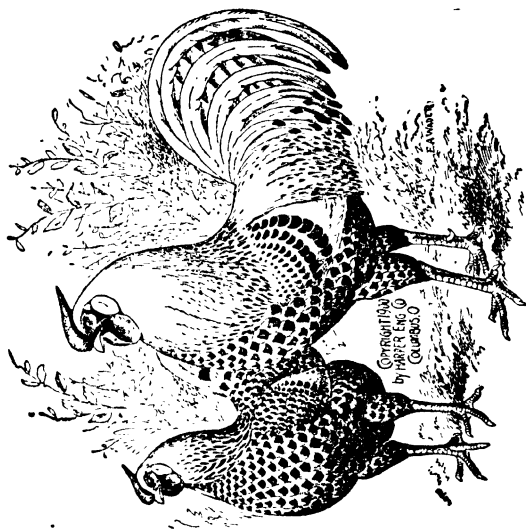
The birds in the breeding-pens must be periodically examined, and if they are too fat, their food must be reduced. The birds must be made to take exercise and scratch for their food.

THE SCIENTIFIC SELECTION OF BREEDING STOCK.—In the selection of birds for breeding purposes, the aim of the fancier should be along the line of both utility and fancy, and his selections made to bring about good results in each direction. And as the development of one does not conflict with the development of the other, there is no good reason why any fancier should not build up a family or strain of birds that excel in both fancy and utility qualities. These qualities are of mutual benefit to each other, and a bird possessing both to a good degree is a better bird and worth more money than one that may be strong in one line and not the other. The utility qualities are mainly those of egg-production, size of body and quality of flesh for market purposes, while those of the fancy are confined to shape of body and colour of plumage. In birds of all classes, except Bantams, good size is an important feature, and this is especially desirable in birds intended for market purposes. So that this practical feature

is also one of equal value from a fancy standpoint. The breeder who raises birds for the market wants good size, and the fancier also desires good size, as it is a standard requirement. It is therefore necessary to select birds as breeders that are of good size, and by size is meant a bird that will reach standard weight without being over-fat. An over-fat bird is never a good breeder, nor is it a desirable bird for the market. It is almost unnecessary to add that good health must accompany good size, and is an indispensable feature in any branch of the poultry industry. In the matter of egg-production, the "fancy" should give it attention as well as "utility," as it is as important to the one as the other. A female may be of unusual merit as an exhibition specimen, but if she is not a good layer, she is of but little profit to her owner. It is the female that combines the two branches of quality that is of value. We all desire to raise as many chicks as possible from our best birds, and the number of chicks that can be produced from a female will gauge her value as a breeder—quality of chicks, of course, to be considered. The size and shape of the eggs laid by our hens is also an important feature. Some hens lay small eggs considering their size, and others lay eggs of poor shape, both undesirable features, as the pullets from such females are apt to have the same failing except as modified by the influence of their sire, which may have been a bird from a female that laid an egg of good size and shape. Selections should be made of those females that lay eggs of good size and shape, and also in the selection of our male birds we should consider this matter, and, if possible, use



PAIR OF ROSE-COMB BROWN LEGHORNS.
Fig. 43.



PAIR OF SILVER-SPANGLED HAMBURG.
Fig. 44.

such birds as are from females that are known to lay eggs of desirable shape and size. A few seasons of such selection, and one would have a strain of fowls that would be of more than ordinary value as layers of large, fine-shaped eggs. It is, of course, necessary, in order to know the eggs laid by each hen, to make use of some device that will enable us to ascertain this fact without any chance for mistakes. I had a hen last season that was a good layer, and her eggs were large and of good shape. She was from a hen that laid a large, fine-shaped egg. And this season I am breeding from one of her pullets that lays a large egg of good shape. I expect to use the most promising of her pullets another season, and also her cockerels. She is a good layer, is large-sized and a good exhibition bird. I have made it a point to consider the size and shape of the eggs laid by a hen in selecting my hens for breeding purposes. It is also a wise plan to consider the disposition of a bird in making selection, especially so in the choice of a male bird. And where possible, other qualities considered, I would select the one with a gallant, generous, active disposition, one that would give his last bit of food to the females of his pen and go without any himself—a bird that is always polite to his mates and is ever-ready to do battle in their behalf. I believe that a male of such disposition will get better chicks and more of them than the bird of surly disposition and lazy movement. It is well, also, to give attention to the disposition of the females, and, as far as possible, select those of the active, energetic type: those that are “hustling” around most of their time instead of sleeping on the roosts or in some

comfortable spot,—the kind that make good sitters and mothers. It is not always possible to select birds that possess all of these desired qualities, but one can combine as many as possible, and each season endeavour to make the combination stronger, always working in the direction of the improvement of all these desirable qualities. It can be done if one will only give attention to it. It is by the selection of the “best” in all respects that real progress is made. The ideal female should possess all these qualities to a great degree; and the ideal male bird should not only possess proper size, disposition, etc., but should be the son of an ideal female. Some may say that I am getting beyond the realm of the practical into that of the ideal when I ask for a combination of all these qualities in our breeding stock. But it is not so; it is practical and possible, and only requires the attention of the breeder along this line to bring it about. No one of these good qualities will conflict with another. And the selection of our breeding stock should be made with a consideration of all factors that may have an influence in developing and establishing all good qualities in the blood of our birds.

INFLUENCE OF THE MALE BIRD.—The breeding of fancy poultry has been gradually growing out of the realm of the theoretical into that of the practical, and the work of our best fanciers has brought it to a point where it may rightly be termed a science, and if one would achieve the highest success, it must be considered as such, and made a study not in a superficial way, but in a thorough, earnest manner,

by watching the results of every move ; of every effort ; and tracing out the conditions and elements that have been the cause. And along this line let us consider one of the important factors of the breeding problem, and that is the "influence of the male bird," and how it may be controlled so as to bring about the best results.

A male bird, to be considered desirable as a breeder, should have an ancestry of undoubted good quality,—a line of birds that have demonstrated their ability of transmitting their good qualities to their progeny. It is as necessary to work for the establishment of this "breeding tendency" as it is of any feature that pertains to quality alone. No matter how much quality of form and plumage a bird may possess, he is of but little account as a breeder if he has not the power to transmit it to his progeny. Individual excellence is a very desirable feature in all breeding stock, but if it is not accompanied by a power to transmit it to their progeny, it is of but little use in the breeding yard. It is results that tend in the right direction that we are after in our work of the breeding season. And a male bird that is possessed of individual excellence and also the power to transmit it to his progeny is a valuable bird for breeding purposes. And when such a bird is in our possession, his blood should be used as largely as possible, so that a line may be established that will be most desirable in quality and breeding influence. It is the male bird that introduces the "life element" into the egg. And every chick from the mating of which he is the head is of his blood. Not

only does he introduce the life element, but by so doing brings into play the influence of the female also, which, in many cases, may be superior to his own and the chick may follow after the hen in point of quality and character. So that while the blood of the male bird enters into the life of each chick, it by no means follows that it will be the controlling influence, and will impart to the chick its own excellence, as it depends upon which parent will be the stronger in the power to transmit the qualities of form and colour. A male bird that is mated to several females oftentimes will vary much in the extent to which his influence will be noticeable in the chicks of the different females and this variation will be caused by the difference in the breeding influence of the females. Some of them may be stronger in this respect than the male bird, and others weaker; and the chicks will naturally develop in quality along the line of that of the stronger parent. Where the male bird is the stronger in this breeding tendency, the cockerels will more nearly resemble him in form and colour and the pullets will also show his influence by their resemblance to his female relation, his mother or sisters. And in the case where the female is the stronger, the cockerel will show a family resemblance to her sire or her brothers, and the pullets will more nearly resemble herself or her female relation. The stronger-blood influence will tend to produce a quality in keeping with that of the family of the bird exercising such influence. And as to which parent possesses it, one cannot tell until the chicks have developed sufficiently to show



PAIR OF CHINA SILKS.
Fig. 45.



DORKINGS.
Fig. 46.

their quality of shape and colour of plumage, when one can tell which family the chick most resembles. There are cases, however, where some unknown influence seems to step in and produce a result that is at variance with the characteristics of either family. And where such result is not pleasing, in the quality it presents, the breeder had better discard the mating of the male bird with that particular female. Where one makes use of both males and females that tend to the production of the same character of quality, it does not matter so much as to which side shall exert the greater influence, as in either case it should be in the right direction. But where one wishes to produce and continue certain good qualities that are possessed most largely by the line of blood from which the male bird has descended, then it is important that he possesses the stronger breeding power, so that these qualities may be transmitted to his chicks. But even where the male bird possesses stronger power to influence the quality of the chicks than any of his females, yet these females will vary in the strength of their influence, and to what extent, can only be told by a comparison of their chicks; and to do this with any degree of certainty, one must breed in pairs, so that the eggs laid by each female may be known and marked. And this would necessitate placing each female by herself and giving the male bird the run of the pen a short time each day, or every other day, or by the use of "trap nests." This last plan would be the easier, and would allow all the females we might wish to mate with any certain male bird to run together and would economise both space and time. The

mating in pairs is really the only scientific way of breeding, as it is the only way in which one may determine to a certainty the parentage of each chick, and by a study of the quality and characteristics of the chicks, be able to determine which side has the greater influence in the production of the qualities they possess. In the breeding of most lines of live-stock, the work is done in pairs, and it is no trouble to determine parentage, but in the case of fowls, where the young breaks forth from the egg into the life of the poultry world, it is necessary to mark the eggs of each female, and set them so that when the chicks hatch they may be given a mark that designates them as the offspring of a certain male and female. It is the only method by which one may with certainty arrive at a knowledge of the parentage of each chick. It may seem to some fanciers that all this work is unnecessary, and is carrying the breeding of "chickens" to a useless extent, but to the "genuine fancier," the one who makes use of his brain as well as his hands, such work will be recognised as the only line that gives results that may be studied and the influences that have brought them about located to a degree of certainty that is impossible under the old style of breeding. Many men are in the "fancy" for the pleasure it affords them, men of brains and intelligence, to whom the scientific method would appeal as the one most apt to give the pleasure they seek, and would call for the exercise of the mental as well as the physical faculties. Dame Nature does not give up her secrets easily, and when it comes to the matter



HYDERABAD BLACK-RED GAME.

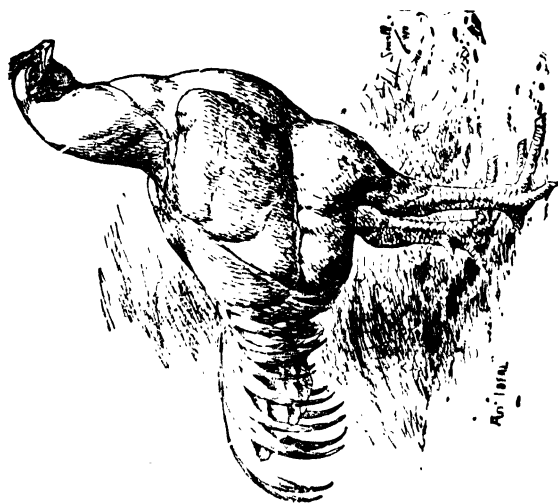
Fig. 47.

of the various influences that possess such power in shaping the results in our efforts in the breeding of fancy poultry, it is necessary that we be able to locate and, as far as possible, control them, and a method or plan that will enable us to do this to the greatest degree of certainty is the one that will admit of the greatest progress.

As the male bird must exert great influence over the quality of his chicks, because of his blood entering into the life of each, it is very important that he possesses qualities, individually and through the blood of his ancestors, that are of the kind we are working to establish in our strain. There is such a difference in the breeding tendencies of the birds of different strains that the only safe way for one to do is to establish a strain of his own and introduce new blood carefully and from a strain that is bred along the same lines as his own—then the danger of conflicting influences will be reduced to the lowest point. One should settle upon the type of a bird he wishes to produce and the style of colour, and stick to them—it, of course, being supposed he will make this choice according to the demands of the standard, and aim to produce a bird that will meet these requirements to as great a degree as possible. In many fanciers' yards one may find several types of birds, in both shape and colour, and no system seems to prevail. This is not as it should be, as our efforts should be directed along definite lines. The breeding of fancy poultry is becoming more and more of a study to our best breeders, and their aim is to gain all knowledge possible, concerning the many

influences that enter into the question of how to bring about the best results in our breeding operations. If these influences cannot be controlled, then only a certain degree of success is possible, and we may not expect to produce birds beyond a limited degree of quality. But with such influences brought under control the limit to quality will depend upon the efforts of the individual fancier and the amount of study he will give the subject. If he looks upon it as a science and considers no part of it as beneath his efforts, he will most likely be successful to a degree that will well repay him for the time and study he has given the subject. One cannot expect to get much for nothing, and anything worth having is worth putting forth some effort to secure. And this is as true of the poultry industry as of anything else, and he who expects to produce birds of high quality must also be willing to master the science that will give the knowledge that will enable him to produce them.

AN EGG TYPE.—It is a disputed question whether such a thing exists with fowls as an egg type. My own observation, however, leads me to believe that the best laying fowls do differ from other fowls of the same breed that are not such good layers. They differ in characteristics that are to be recognized by one who is familiar with his fowls. Theoretically it is perfectly natural and plausible that the pronounced development of certain functions would call for a harmonious structural development of the individual to support this function. For instance, the function of speed



WHITE INDIAN GAME, AMERICAN TYPE.
Fig. 48.



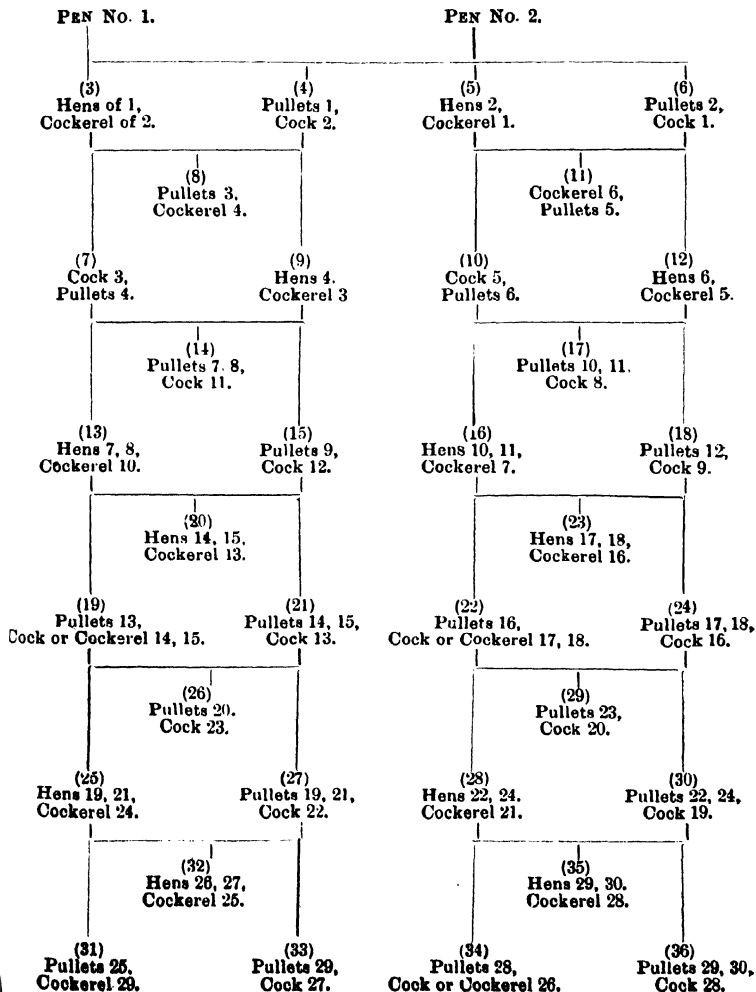
HYDERABAD GAME HEN.
Fig. 49.

is accompanied with lightness of body, high nervous energy, great endurance and pluck and a striking adaptability of size and shape of bone and muscle to do the work demanded with the least waste of energy. In short, it is simply the result of the silent working of the great law of adaptation which has made the pronounced type in all of our breeds. This has been hastened and sometimes hindered by the hand of man. The contrast between the race horse and the draft horse, the milch cow and beef cow, the greyhound and bull dog, the Mediterranean fowl and the Asiatic is but another evidence of the relation between type and performance. These types do not simply happen so ; they have gradually developed to be the best for the purpose. When a hen is born with parts better adapted to egg-production than any hen heretofore, she will, with proper care and food, make the largest record. This sounds like a self-evident truth. And it undoubtedly is. So is an egg type. But the egg type does not mean body-shape alone. That's where most failures occur in selection. We must remember that shape is only a factor in the productive power of an individual. A hen may be perfect in form and still be a poor producer, because not inheriting a high reproductive tendency ; just as a locomotive may be perfectly formed in every part to make great speed, but may fail because of poor metal. Some hens with perfect form and inherited prolificacy to be large egg-producers may fail on account of lack of vitality and vigour of constitution to withstand the drain upon the system. When, however, these qualities are combined in one hen, we get the highest

production. Such a hen will differ in characteristics which will distinguish her from other hens of the same breed which are not good layers. But she will have the egg-laying type. Most poultrymen who have observed the hens that are found most often on the nest and have been accustomed to selecting their breeding pens with this end in view, will agree with the statements that have been made. They can quite accurately separate the best layers from the poorest layers. I suggest that those breeders who have never before given it a thought, or who do not believe in egg type, should try selecting a pen of the best layers and save their eggs to breed from, and see for themselves whether they do not get a finer lot of laying fowls than they ever had before. The first thing that should be looked to is a fowl that is large and that has a strong vigorous constitution, without which all else is for naught. You will observe the long rangy back and the extreme depth of body from back to keel, and particularly the large fluff. The whole structure indicates at a glance a large development of the egg-producing machinery, and a great capacity to supply this machinery with digested food. There is a decided effeminate, motherly appearance in a good layer in direct contrast to the rooster-headed, thick-necked hen. She is generally very active, inquisitive and friendly, which all speak for great nerve development and intelligence. According to the correlation of parts, she will have a large comb. The condition of the comb is closely related to the strength and vigour of the egg machinery. When only the best egg-producers are kept, then you can feel assured that the chicks from their

PEDIGREE.

Proper method of Pure Breeding. Begin with two Pens of Fowls.



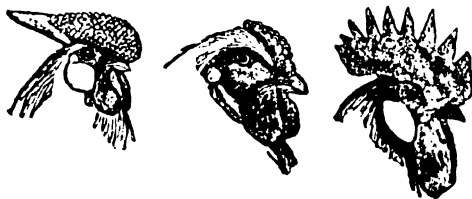
eggs will inherit their inclination to lay, and by careful selection each year the egg-production of your whole flock will be gradually increased. This increase per hen is a growing profit in her favour that will more than repay the effort for her improvement.

CHAPTER VIII.

EGGS AND HATCHING.

WHEN HENS LAY.—Hens usually begin to lay in February or March and continue laying, with a few intermissions, until July or August, when they go into moult. The hens usually begin to moult in July or August, and get through it in September or October. During this time they should be separated and not forced to lay. Some hens lay during October, November, December and January, but not many will do so. By careful breeding, fowls can be got to lay in October, November and December. The price of eggs is highest during the cold season, and it is a decided advantage to the owner to be able to put eggs into the market at this season.

Pullets generally begin to lay when they are from six to nine months old. Birds hatched in December, January, February and March will begin to lay in October or November. Pullets hatched in April, May and June will begin to lay in January to March. Those hatched in July and August will lay in March and April. Pullets hatched in October and November will lay in May and June. The second year these hens will begin to lay a month or so later than they did the first year; and birds above two years old will not begin to lay until February and March or later.



TYPES OF COMBS.

Fig. 51.

1. Rose Comb.

2. Pea Comb.

3. Single Comb.

Chickens hatched in January, February, March and April will be ready for market in the cold season, when they will sell for better prices.

THE BEST TIME TO SET HENS.—The best time to raise chickens altogether depends upon the climate in which the chickens are to be raised.

The best time in the hills and cold climates will be the worst time in the Punjab and United Provinces, and the best time in the United Provinces will be the worst for some other places where the climate is very wet and damp.

There are certain parts of India, such as the Punjab, United Provinces and Central Provinces, where the heat is very great and fatal to chickens, but the rainy season is most favourable to them, as the rainfall in these parts is not so heavy. There is also sufficient green food and insect-life for the chickens. The hot winds during April, May and June kill a large number of chickens, but they will do very well in July, August and September. March, April, May and June are the most favourable months for raising chickens in places like Simla, Naini Tal, Mussoorie, Darjeeling, Assam, Dooars, and wherever the cold is very severe during the cold season, and the moisture great during the rains. In Eastern and Lower Bengal, Tirhoot, and all parts of India where there are no westerly hot winds, chickens can be raised most successfully from October to the end of June.

Chickens raised during April, May and June thrive very well in places where hot winds do not blow, when sufficient shade and green food are provided and perfect liberty allowed.

During this period large numbers can be raised and kept at nights in open sheds, but care must be taken not to overcrowd the birds or keep them too warm. I have raised large numbers of chickens in Bengal during the hot weather, and they have done well.

Chickens hatched during the hot weather grow large enough to take care of themselves during the rains ; the only special care they need is to keep them out of the water and storms. They grow rapidly during July, August, September and October, and commence to lay in December and January.

Wherever the rainfall is not heavy—does not exceed from 40 to 50 inches during the year—chickens can be most successfully raised from the 15th June to the end of August, if the hens are not moulting. Until a few years ago I considered the rainy season to be very unfavourable to poultry raising, but on close investigation I felt sure I was mistaken, so I resolved to experiment. My experiments led me to the following conclusions :—

(i) Most birds in their wild state raise their young from the 15th June to the end of August. They go into moult in September and are through by the end of October.

(ii) During the rains there is plenty of green food for the birds.

(iii) During the rains there is a great deal of animal food natural to poultry.

(iv) During the rains the trees and shrubs are in full foliage and afford sufficient shade and protection to the birds.

(v) During the rains many of the hens, especially the Indian breeds, lay very well, and the eggs are very fertile.

(vi) Chickens raised at this period grow fast and become large and strong enough to go through the cold season.

All these conditions are in favour of poultry raising. The only thing I have to guard against is the frequent showers and heavy rains ; the chickens have to be taken up into shelter immediately it rains, and as soon as the rain stops, they are again let out.

Eggs are very fertile during the rains, and the chickens hatch out well, but very special care is needed to protect the little ones from chills, and at the same time not to keep them confined too much. Those who raise chickens during the rains must provide a good large covered run and shelter for the birds. It is always a good plan to hatch some chickens during July and August, if possible.

Eggs are very cheap during the rainy season, and even if fifty per cent. of the chickens are reared, it will be a great advantage. For some years past I have raised a large number of chickens during the period from June to August in Bengal, and have succeeded in obtaining very good results. The losses have been less than 20 per cent., and the birds have kept remarkably healthy and matured rapidly.

Chickens hatched from October to the end of January do very well in all parts of India except the hills, if they are given proper warmth and more nourishing food and are carefully protected from the cold winds and from wet and damp. January, February, March and April are the most favourable

months of the year, and chickens can be raised successfully in the plains in nearly all parts of India.

The climate varies very much in different parts of India, and the best time is not the same time in every place. Raise your chickens at the time of the year best suited to your climate. Raise as many as you can from October to January and from January to April, and from April to July and from July to September. But give the birds rest while they are moulting. Do not set the eggs of birds that are in moult, and never set a hen that has gone into moult.

SELECTION OF EGGS.—The selection of eggs for setting is a most important matter; for on the eggs depend the qualities of the forthcoming brood. The following rules must be faithfully adhered to:—

1. Only eggs from the best hens must be set.

2. Only fresh eggs must be set. By fresh I mean eggs not more than three days old in the hot weather, and not more than seven days old in the cold season.

When kept under proper conditions, eggs can be kept for eighteen to twenty-one days during the cold weather, and when set will hatch successfully. But such eggs should be set under hens and not placed in an incubator.

Fresh eggs, if all be well, hatch out in good time, and the chickens are strong and lively; the stale ones hatch later, and the chickens are often too weak to break the shell. I have also noticed, that even when stale eggs have hatched the subsequent deaths have principally occurred in this portion of the brood; but when all the eggs were fresh, not

only nearly every one of them hatched within an hour or two of the first one, but the losses were very few.

3. Very small and very large eggs should be rejected. Only eggs of an ordinary shape and with a smooth surface should be used for hatching. Different breeds of fowls lay different-size eggs, but the size of the egg does not always indicate the size of the fowl it will produce. The Bantam lay the smallest egg, and the Spanish the largest, but the Spanish is the smallest in size of body, save only the Bantam and Hamburg; whereas, on the other hand, the Brahma and Cochins, which are the largest fowls, do not lay very large eggs. Larger eggs than usually laid by the fowl should not be selected for hatching. Very large eggs are generally double-yolked, and very small ones yolkless.

4. Eggs intended for hatching must not be shaken, exposed to the sun, kept in wet or damp places, or placed in water. No oil, dirt or other liquid substance must be allowed to touch them, and they must be kept away from strong and bad odours. The eggs must never be kept in an air-tight vessel.

5. If a breeding pen is not properly mated, the eggs from that pen will not be a success. A badly mated pen will produce weak and otherwise defective chickens.

6. There are many theories abroad about being able to tell the sex of the chickens in the eggs, but none of these theories are proved by facts. The most plausible idea is that the first half of the eggs laid are female, and the second half of the number laid are male, but even this is not correct.

Some people will tell you that the long eggs will produce males and the round ones females ; such ideas only reveal the ignorance of those who entertain them.

SELECTION OF THE MOTHER.—Pullets of the first year, usually, are not good sitters and mothers. The second time a hen becomes broody, she will usually sit well and be a good mother. A wild, quarrelsome or fidgetty hen will make a bad mother.

The hen selected for sitting must be in perfect health, and have all her feathers on her. A bald hen or one minus some feathers or in moult should never be selected for hatching, for she will not properly cover her eggs. The hen should be examined to see that she is free from lice and disease.

The hen should be thoroughly broody. A broody hen can be recognized by her constant determination to sit in her nest. She will scarcely go out to eat, and will make a peculiar clucking sound and ruffle her feathers when she is touched. Many persons put eggs under a hen when she is not properly broody, and consequently the eggs are destroyed. Some hens will squat in their house for days, but when put on eggs be very troublesome, and will stand on the eggs and often break them. Such hens must be avoided.

Hens will sometimes lay several eggs after beginning to sit. Every egg placed under a hen should be marked quite round with ink, so that the egg laid in the nest may be detected and removed.

The best time to set a hen is at night, as then she is more likely to settle down to her work. Besides, if the eggs

are put under the hen at night, the chickens will begin to appear on the night of the 21st day, and will have the whole night to rest and gain strength.

PURCHASING CLUCKED HENS.—When you have to buy a clucked hen, you should buy one that has been set on eggs and been sitting for three or four days. Buy her together with her eggs and nest, place her nest in a quiet place, and let her sit for a day and night undisturbed, place food and water near her. After she has been sitting for twenty-four hours, remove her common eggs and put the good eggs under her. I have always found it a good plan to allow a hen to sit on common eggs for a day or two before giving her good eggs.

THE NEST.—The nest on which the hen is placed must be made in a quiet corner where she will not be disturbed. Make a box twenty inches high and fifteen inches square; the top and sides must be made of half-inch mesh wire-netting, and the bottom and lower part of the sides of planks, with a door made of half-inch mesh wire-netting, fifteen inches square, on one side. Put five inches of fine dry cow-dung ashes or coal ashes in the box, make an oval excavation and cover this with a thin even layer of soft broken hay. Place the eggs on the nest in this box, and gently put the hen on the eggs and close the door. In such a box as this the hen and eggs will be safe from the other fowls and from cats and rats, and she will have plenty of ventilation. The box must be thoroughly rubbed over with kerosene oil, and then well whitewashed both inside and outside, and a lot of flower of sulphur and insect powder

sprinkled over the nest once or twice a week. Great care must be taken to prevent lice infecting the box and nest.

Another way of making a nest is this : Take a small *gumla* or earthen vessel about fifteen inches in diameter and eight inches deep, fill it three-quarters full with finely sifted dry cowdung ashes or fine coal ashes, press down and make a hollow, like the inside of a saucer, sprinkle some flower of sulphur over the nest, and put the eggs on this, gently place the hen on the eggs and leave her alone. The nest must be made in a place where the hen will be safe from cats, rats, etc., and away from the other fowls. Great care should be taken to provide a nest just large enough for the hen to properly sit in. The nest must not be too large, or else the eggs will roll away from under the hen and become chilled and spoiled. If the nest is too small, the hen will crush the eggs in her effort to get in and out of the nest and in turning the eggs. If the nest is only large enough for the hen to cover comfortably, she will sit properly and treat the eggs well.

It is always best to have a separate house for sitting-hens. If they are kept in the same house as the other fowls, or where they will be constantly disturbed, they will not sit well, and will spoil their eggs. If two or three hens only be put on eggs, they can be kept each in a different outhouse or godown, and be let out once or twice every day ; but if a number of hens be set, it is advisable to have a separate house and run for the sitting-hens, and place all the nests in this house, the nests should be placed at least six feet apart. All

the hens can then be let out of their nests together, and put back in half an hour.

A sitting-hen must not be kept in a damp, dirty, draughty or badly ventilated place.

HOW TO TREAT SITTING-HENS.—Before putting the hen on the eggs, she must be placed under a *tappa* or basket and fed and watered; a plentiful supply of good grain must be given. It is a good plan to set a hen on half a dozen common eggs, and allow her to sit and settle down for two or three days, when the common eggs should be removed and the good eggs placed under her. This will ensure the safety of the good eggs. She must be allowed to remain undisturbed for about twenty-four hours after she is placed upon her eggs. On the second day, and every subsequent day, she must be allowed out once or twice a day. Some hens leave their nests twice a day. It will do no harm if she does, so long as she is not allowed to keep off her eggs for more than twenty minutes each time.

The hen must have a plentiful supply of good whole grain wheat or paddy and pure water, but no soft food. The food must be given when she comes off her nest, and never given in the box. If the food is given at a regular hour every day, she will come out exactly at that hour. A box of dry earth or ashes must be kept in the yard, where the hen can easily get to it. After she has eaten she will take a dust-bath and rid herself of the vermin that may be troubling her. Unless a dust-bath is provided, the hen will get covered with vermin. If the hen keeps away from her eggs longer

than twenty or thirty minutes in the hot weather and ten or fifteen minutes in the cold weather, gently drive her into her box or room and close the door.

Hens ought to come off their eggs once every day. They require the few minutes run and daily supply of food. The temporary change from the cramped position is good for them and the exposure to the fresh air greatly benefits the eggs. If the hen will not come off her nest, she must be gently lifted off at a given hour every day. Unless this is done, both the hen and the eggs will be injured. The person who lifts the hen must carefully feel under her wings before removing her from the nest, in order to make sure that no egg is being held there. She must be lifted gently, by placing both hands under her wings.

When the nest and hen are treated with flower of sulphur and insect powder regularly once or twice a week, they will be perfectly free from lice. If the hen is troubled with lice, her nest and box must be changed, and some insect powder and flower of sulphur must be sprinkled over the new nest and rubbed under the hen's wings, and over her head and back.

Your success with the eggs depends in a very great measure upon the hen under which you put them. If during the first three days the hen does not sit properly, the germ will not form; if about the middle of the period of incubation the hen neglects the eggs, they will be addled; if at the latter part of incubation the hen fails, the chickens will die in the shell. Infertile eggs will remain clear like new-laid eggs. If an egg becomes rotten, then be sure it

was fertile, but has become addled. Some hens will spoil every egg placed under them. Some hens in turning their eggs fail to properly cover one or two eggs in the nest; the next time they turn them they take the exposed ones in and allow one or two others to remain uncovered: in this way they will spoil every egg in the nest. Some hens take to breaking and eating the eggs. A bad hen will spoil her eggs, but frequently a good hen will spoil her eggs if she is tormented by vermin, rats, cats or people. Hunger or disease will also cause a hen to neglect her eggs. A good hen, if properly cared for, should raise 7 chickens out of 9 eggs if the eggs be sound. In many cases the eggs are spoiled by the nest not being made properly, or the hen and eggs not receiving proper attention before setting.

HOW TO TREAT THE EGGS.—After the eggs have been placed under the hen, all that needs to be done is to inspect them every day to see that they are all right.

Sometimes an egg gets broken in the nest; when this happens, remove the remaining eggs and wash and dry them carefully; change the earth and ashes of the nest; if there be any of the broken egg sticking about the hen, wash it away as well. Unless this is done, the remaining eggs will be injured. The water used for washing the eggs and hen must be 102°F., no colder and certainly no hotter. As soon as the eggs and hen have been cleaned and dried, the eggs must be placed under her in a new nest.

Should an egg get chipped or indented, so long as the skin below the shell be not broken, there is hope for it. The

flaw should be patched up with gummed paper. A good thing to mend such a flaw is the marginal paper round sheets of postage stamps. I have saved many eggs in this way, and the young ones have been successfully hatched. The gummed paper must be only large enough to cover the flaw, and must be held to the egg with the finger or palm of the hand until it properly sticks to the shell. If the skin under the shell be pierced and air have got into the egg, there is no hope of saving it.

There are powerful egg-testers sold, by which it is possible to discover the infertile eggs. Infertile and addled eggs must be removed from the nest. The following is a simple method of testing the fertility of eggs :—Take a piece of stout card-board (the cover of an old book will do), and cut a hole in it the shape of an egg, only a little smaller, place one of the eggs sideways against the hole, and then hold up to the light ; the light must be as strong as possible, but the egg must not be brought closer than six inches to it. If the egg is perfectly transparent, like a new-laid egg, it is infertile ; but if a small dark body is seen floating about the centre of the egg, it contains a chicken. The eggs should be thus tested on the fourteenth day after setting. It is impossible to tell if an egg is fertile or not until the 10th day after setting. An egg that is quite clear after being twenty-one days under the hen is infertile ; if the egg has a partly-formed chicken in it, or is rotten, then it is addled ; if the chicken is fully formed and is dead in the shell, it is spoiled. If the germ has formed in the egg and not hatched, it was fertile, but has

been addled or spoiled by some cause or other for which the eggs may not be to blame. I prefer the following method of testing eggs:—On the nineteenth or twentieth day after setting fill a large bowl with warm water—the temperature of the water must be exactly 102° , great care being taken that it is not colder or hotter—place the eggs in the water. After a minute the fertile eggs containing live chickens will wriggle in the water; this is caused by the chickens endeavouring to make their escape from the shells. The infertile and addled eggs will float about, but will not wriggle. Sometimes the chickens will be heard to cry in the eggs when they are placed in the warm water. The eggs must be allowed to remain only two minutes in the water, and then taken out, properly dried and put back under the hen.

Some persons occasionally sprinkle warm water over the eggs. When the weather is very hot and dry, it may be necessary to do this in order to give moisture. In Bengal I have not found it necessary to sprinkle the eggs.

On the twentieth or twenty-first day the chickens will begin to appear. Now, the hen must be fed, carefully put back on the nest and let alone for twelve or twenty-four hours. Occasionally the hand must be put under her to find and remove the egg-shells. These vacant shells, if not removed, may become attached to the other eggs and prevent the chickens from coming out.

The chickens need no food for the first thirty or thirty-six hours, so they must be left under their mother undisturbed for about twenty-four hours. If after twenty-four

hours there be some eggs under the hen still unhatched, these eggs must be placed under another hen, and the chickens with their mother removed to a clean and warm box. Some chickens will be later in hatching than others, so I have found it a very good plan to set two hens on the same day, and, when the chickens are hatching, give the early ones to one hen and the ones hatched later to the other hen.

A day or two before the chickens appear the nest and eggs must be sprinkled with flower of sulphur ; and after the chickens and hen have been removed from the nest, they should be gently rubbed over with Keating's insect powder.

Rats often steal eggs and chickens from under the hens and they sometimes kill the hen. The only remedy is to keep the hen with her eggs or chickens in a box with a good strong bottom and half-inch mesh wire-netting top and sides.

Should any of the chickens be unable to get out of the shell, they may be aided, but, as a rule, if they cannot get out themselves, they are generally not worth the trouble to rear. The best way to help the hatching is to place the egg, with the chipped portion out of the water, in a bowl of warm water (102°) ; keep the egg in the water for a couple of minutes, and then return it to the nest. This will soften the shell and enable the chicken to break it. Breaking the shell is dangerous, for if blood is drawn, death or deformity will be sure to ensue.

NUMBER OF EGGS UNDER A HEN.—The size of the hen and the state of the weather must decide the number of eggs to be placed under her. If the hen be large and well-

feathered, and if the weather be dry and warm, then from nine to twelve large eggs may be placed under her ; if the weather be cold, eight to nine should be given. Small hens should have only six eggs in the warm weather and four in the cold weather. If the eggs are small, more may be given. No more eggs should be placed under a hen than she can comfortably cover. It is better to place too few than too many. In the cold weather the chickens need shelter and warmth ; if they do not get it, they will die. So a hen should not be given more than six to eight chickens when the weather is cold.

HOW TO KEEP EGGS.—The quality of the eggs to be set must be above suspicion. In order to ensure this, every egg should have legibly written upon it in pencil or ink the date on which it was laid. The best way to keep eggs is as follows :—Have a large board (as large or as small as necessary) with a number of oblong holes, about an inch and a quarter or an inch and a half, bored in regular rows an inch or an inch and a half apart. Fix this board on a stand of four legs, and place the eggs, the larger ends downward, on the holes. This egg-stand must be kept in a quiet, clean, dry and properly ventilated place, where the eggs will not be exposed to concussion, noise, bad odour or heat. Turn the eggs over once a day.

HOW TO TREAT EGGS WHICH HAVE TRAVELLED.—Eggs which have been brought by train or otherwise travelled, run the risk of being broken ; not only so, but they are very liable to become spoiled. Before being set under the hen, if

the eggs are taken out of the box and kept in the stand at rest and free from jar for twenty-four hours, they have a better chance of hatching. They must not be kept standing for more than twenty-four hours. The journey injures the germ, but by being rested it seems to recover from the injuries. Eggs are not injured so much in travelling by train as by post. A great deal depends upon the distance and season of the year the eggs have travelled, and also upon the treatment the eggs receive after reaching their destination. If fifty per cent. of travelled eggs hatch out, it will be a great success. A great deal also depends upon the way the eggs are packed.

PUTTING THE HEN OFF THE CLUCK.—To put a feather in the nose of the hen and duck her in cold water is cruel and as ineffectual as injurious. The best method is to place the hen in a coop with a barred front and barred bottom and place it in a corner of the shed raised a foot from the ground. Keep the bird in this coop, and give her plenty of grain and water. This will effectually break the cluck in a few days.

It is not always wise to refuse to allow a hen to sit. She needs the rest, and it will be well to allow her to remain on the nest for a week or ten days, even if there are no eggs to place under her. If a hen is not allowed to rest, but is forced to lay, her eggs will prove infertile.

HOW TO PACK EGGS.—Eggs are best packed in small baskets, but if packed in boxes, the cover must be tied or screwed, and never nailed down; if nailed down, every egg may be damaged. I myself prefer packing eggs in boxes.

A box 15 inches long, 11 inches wide, and 9 inches deep will be sufficiently large to hold from 12 to 18 eggs. The best packing is to wrap each egg separately and rather loosely in a piece of soft paper, and then very carefully inbed the eggs thus guarded, but not too lightly, in the box, with a thick layer of soft cut straw between each egg. Place three inches of soft cut straw in the bottom of the box, press down this straw, and place nine eggs on the straw, three rows, three in each row, then put straw between each egg and also between the eggs and box. Put a layer of one inch of straw over the eggs, then a second row of eggs. They must be packed firmly but not too tightly. Chaff or sawdust is too solid, and should not be used. Eggs packed in this way will go hundreds of miles, without injury. Let the box or basket, whichever is used, have a handle made of string. No one but an eye-witness has any conception of how a handleless package gets knocked about. One porter passes it to another, and perhaps he to the guard; or it has, may be, to go by a carrier, or a servant is sent to the station for it, and so the harm is done. It is not the distance that does the injury, but the knocks and tumbles that packages get. If they all had handles, they would, in most cases, certainly be taken up by them, and the chances of the eggs hatching be greatly increased. All must allow that it is only correct for a setting of eggs to be properly and securely packed when sold and has to go any distance by rail or carriage, and that the purchaser naturally looks for it. We would, however, ask purchasers not to be too quick in writing sharply about the

non-success of a setting, for often the blame may be traced to their own door ; and, if not, one severe fall at a station or one heavy jarring will ruin the whole success of a setting. We repeatedly hear of failures among the eggs of our honest and most upright vendors, whose other eggs sent out have done well, and the cause could only be traced to some such accident as mentioned above. That a handle easy to lay hold of is of great value to every egg package we are quite sure, and would recommend purchasers to insist upon having it. We would also add that much acrimony would be avoided between purchaser and seller if the latter placed a notice on each package sent out, to the effect that eggs before being put in an incubator or under a hen should be rested for twenty-four hours.

PURCHASING EGGS.—When it is necessary to purchase eggs for setting, they should be obtained from persons of good repute who are experienced breeders and not novices. Some persons, thinking they are economical, get the cheapest eggs that are to be had, and when the chickens hatch out and grow up are surprised to find them good for nothing. Getting cheap eggs for setting is altogether false economy. A few annas more for each egg would often result in each chicken being worth a few rupees more. Then, again, some people charge large prices for eggs, but when the chickens develop they are found to be not exactly what they were represented to be. Six rupees a dozen for eggs from good exhibition fowls is a very fair price. Some people ask twelve and even twenty-four rupees a dozen for eggs from

their fowls. Their fowls must be extraordinarily good birds for them to want such very high prices for their eggs. But are they really so ?

The great majority of people know little or nothing about poultry. They have no good poultry book and read no poultry paper. Their ignorance leads them into many mistakes. Then, again, some people think that whatever they have got is the best, and whatever other people may have is not worth keeping ; such people are not to be relied on ; their judgment is not to be trusted.

If a person gets a name for supplying first-class eggs and fowls, he will prosper ; while if he does not keep his word, if he indulges in " tricks of the trade," selling stale or infertile eggs for fresh and good ones, or eggs of cross-breed for those of pure-breed, old fowls for young ones, diseased birds for healthy ones, or cross-breds for pure breeds, people will quickly get to know his ways and will leave him for some one who is honest. " Honesty is the best policy," even in poultry-breeding.

It frequently happens that the person who buys eggs or fowls is very ignorant about the quality of the breed and the treatment of the eggs, and his ignorance leads him to misjudge the seller. If the eggs are not treated properly, they certainly will be spoiled, and the seller cannot be accused of selling unsound eggs. I have often heard sellers abused for what has been entirely the fault of the buyer. One man kept his eggs standing for three days after he received them before he put them under a hen ; another man took the eggs

out of the box and immediately set them under a hen. A lady put her eggs under a hen and covered her over with a small basket and allowed her out once in three days. Another lady trusted her servant to such an extent that he felt safe in changing the eggs under the hen and substituting common ones. When the results proved unsatisfactory, those people felt they had been defrauded by the persons who had supplied the eggs.

Some people do not know what a bird should be. They want to know why a Light Brahma has black on her hackle and tail, or a Dark Brahma white on his neck and back, or why a Cochin has a tail, or why a Langshan has such few feathers on its legs, and a lot of such absurdities ; and conclude by saying that they have been duped in the birds they have purchased. Such people should spend six months on a poultry farm or else invest in a few first-class poultry books and papers, and devote a few months in studying them before they attempt to breed fowls. It is well for people to remember that every bird of a pure breed is not a perfect bird fit for exhibition. First-class exhibition birds are very rare and expensive. The reason is that it needs especial breeding and rearing to produce certain qualities, and not more than one in 50 or 100 chickens of the purest breed will possess all those qualities required by the standard of first-class exhibition in England, America, and Australia. Frequently first-class show birds have been sold for from £50 to £150 each. The time may come when in India we can get grand exhibition birds for 20 and 30 rupees each,

but for the present we must be satisfied if we can get really good pure-bred birds for breeding stock from 25 to 50 rupees a trio, and exhibition birds for 50 to 100 rupees each. If people are willing to pay only 2 to 5 rupees for a bird, they need expect nothing more than inferior quality or culls. It is much more economical to buy good reliable stock at from 50 to 100 rupees a trio than it is to buy ordinary birds for 3 or 5 rupees each.

THE FAITHFUL HEN.—It is remarkable how many good and faithful sitting-hens are owned by people who buy eggs for hatching : and it is still more remarkable how these same good and faithful hens fail to hatch the eggs bought. Much depends on the handling the eggs receive on arrival, and the nest and the hen. One cannot place a nest “ anywhere ” and obtain a full hatch of all fertile eggs. Neither can he turn the matter entirely over to the hen, as she is usually managed, and get a full hatch. A large number of people give little thought to the location of the nest, and a still larger number leave the entire matter of hatching to the hen, and hence the growling and grumbling about poor hatches. When I gather fresh eggs from the nest, pack them as carefully as I would like to have eggs that are shipped to me packed, I feel that I have about done my share in the transaction. If they reach their destination, the matter then rests with the buyer. If he fails to obtain a satisfactory hatch, his management is at fault and he has no right to demand of me that I refill the order. But they will do it ; and as I very much dislike to feel somebody “ has it in for me,” I refill many orders every

year, even when I know that the buyer is wholly to blame for the failure. About 48 people in every 50 imagine that anybody can set a hen, so that she will hatch a nestful of eggs all right. If she fails to fulfil their expectations, they blame the eggs or the stock that produced them. Not once do they think there can be anything wrong with the shape of the nest or its location, or with the management of the hen. The hen will do a great deal; still there is considerable room for the exercise of good common-sense and quite a lot of skill on the part of her manager if he possess either.

TO BUY EGGS OR BIRDS.—If a person wishes to get good reliable stock economically, and if time be no object, he should visit some reliable poultry breeder, or else write to him, and arrange to purchase six lots of eggs from him, twelve eggs in each lot, and set these eggs under good country hens and raise the chickens. He should get eggs of only one breed. The best way to do is to get a third of the eggs between October and December, and a third between February and March, and a third between April and June; even if half the eggs hatch and half the chickens are reared successfully, this will give him eighteen fowls for the money he would have had to pay for two or three birds if he had bought them. But if a person has the money and is willing to use it, he should purchase a cock and three hens of the breed he wants, and proceed to raise the chickens. Before the eggs or fowls are purchased, the fowl-house, the run, coops, etc., should be made and kept ready to receive them when they

arrive. It is not wise to purchase the fowls first and make their houses and runs afterwards.

EGGS FOR SETTING.—There is every reason to believe that the next season will be a repetition of former ones in the matter of occasional unsatisfactory results obtained from eggs purchased for hatching purposes. The very nature of the business makes this a foregone conclusion, and as the number of persons becoming interested in poultry for the first time runs into the thousands, it is perhaps timely and appropriate to mention some of the conditions affecting the business which, while thoroughly understood by older breeders, will be in the nature of instructions to the army of purchasers above referred to. Buying eggs is something of a lottery. We often see the statement that, "Like will produce like," meaning, as generally interpreted, that high scoring birds will produce their equal. This is only partially true, and amateurs should not be misled by it. Any breeder who has ever mated a pen of birds knows that a majority of the progeny will not be the equal of the parent stock, and this is true even when line breeding is intelligently practised. This precludes the possibility of getting all prize-winners from a setting of eggs. The blood lines in the various families of fowls are more or less antagonistic and the mating of high grade specimens will often bring out the latent characteristics in the progeny and defects will be developed which do not show in either of the parents. These conditions are probably responsible for more dissatisfaction than any others. They are the agencies which influence the hatch as far as the quality of the progeny is

concerned. In regard to the number of chicks produced, there are obligations to be fulfilled upon the part of both buyer and seller, and which both parties to the transaction should duly consider. The seller should keep his breeding birds in the best condition. In the first place, they should be of just such quality as he represents. They should be ~~entirely free from disease. They should be vigorous and~~ hardy and of strong vitality and not exhausted and worn out from too prolonged service in the breeding pens, or bad management. They should not be over-fat and the chances of fertility thereby lessened. They should be kept as free from lice as eternal vigilance can make them. Crowded quarters and too close confinement should be avoided. Animal and green food should be provided if the birds are not on good range. In many cases the male birds need to be fed separately. Care should be taken to see that the matings are congenial to the individual specimens. Eggs should be kept in a reasonably even temperature. Care should be used in packing for transit both in regard to the manner of packing and the chances of the box or basket to stand rough handling. The buyer likewise has a few obligations to fulfil before he can justly criticise the seller. He must remember that, according to the established rule of trade, he assumes all responsibility for the welfare of the eggs after the shipper has delivered them to the Railway Company in good condition. If the package is exposed to bad weather by the Railway Company at some railroad station, or the germ is started by the eggs remaining a couple

of days in an overheated waggon, or if some messenger drops the package on the floor or platform and jars the eggs enough to injure them, these are not the faults of the seller, but are some of the chances the buyer takes. Then, there are several things after the receipt of the eggs for which the buyer is responsible. It should be remembered that some hens, even ~~though they~~ sit steadily, are not able to generate enough heat to properly incubate a setting of eggs. This may be a natural condition, or it may be the cause of the ill-health of the birds. Too many eggs should not be placed under a hen. Twelve eggs are too many. The hen should be free from lice so that she will not be compelled to leave the nest or stand up in it for relief. It is possible for her to sit too steady and ruin the hatch. She may leave the nest too long at a time when you do not see her. She may get off at dusk and not find her way back till daybreak, and you cannot say absolutely that she stuck to the nest unless you saw her every hour out of each twenty-four. Much may depend upon the make-up and location of the nest and specially under certain conditions of the weather. After the chicks are hatched they must receive proper care and feed, or they will never develop into prize-winners even though they have the foundation for these characteristics. If you have had an unsatisfactory hatch, do not write the seller a nasty letter, but consider whether or not you might be at fault.

Now, for the buyer of birds, for he has a duty also to perform. First, he should write for first-class stock, if that is what he wants. He should not write for something nearly

as good, or for culls, or for birds "for only breeding-stock," unless he expects just such fowls to be sent him. No man ever got prize-birds by pretending that he only desired something else. Frankness and truth are essential. When eggs are bought, the buyer must be prepared for incubating them. He should then not be in a hurry, after the chicks are hatched, to raise objections. Wait awhile for results. The chicks will show their quality when they are six months old.

If the seller does not give satisfaction and claims the chicks are the best, offer them to him at a fair price, and he will buy them if he has confidence in his stock; but be prepared to offer conclusive proof that they are from his birds. If the buyer claims that the chicks are not true to breed, let the seller test his sincerity by offering to buy them. We suggest this as one of the modes of adjusting a difficulty.

Then there is Nature as a factor. No man can "guarantee" eggs to hatch. An egg is one of the "unknowable" things, and both the seller and buyer should understand that fact. Even two settings of eggs from the same flock may not give the same results with different hens as sitters. If buyers will consider this matter, they will be better satisfied in their dealings. Always remember Nature's laws, and do not overlook the position of the poultry-breeder, who must sustain his reputation, yet has no control over the germ of the eggs, the vigour of the embryo chick, the conditions of incubation, or the natural laws of reproduction. He can only send the buyer the eggs from hens kept under

good conditions, but he cannot tread within the dominion of Nature.

Careless expressmen, improper handling and various obstacles for which the buyer and seller are not responsible, are also causes of disagreement ; for eggs are fragile things, and no man in any business has so many drawbacks against him as the breeder of poultry. Considering that the breeder sells "future life," he is more honourable than may be supposed, for he has the buyer, Nature, the railroad company, and mean sitting-hens, all combined as factors in the transaction. And yet he is not always happy—when he reads his correspondence.

Fortunately, these things are better understood than formerly, and the "kickers" are not as numerous now as they have been in the past.—*Poultry Paper*.

DAY-OLD CHICKENS.—Some breeders sell day-old chickens. As soon as they are hatched the chickens are put in specially made boxes and sent distances of 500 or more miles. As they need no food for thirty-six hours, the long fast and the journey do them no harm. These chickens of pure-bred stock sell for from Rs. 9 to Rs. 12 a dozen. When procurable, it is more economical to buy a dozen chickens for Rs. 12 than a dozen eggs for Rs. 6. Before procuring the chicks, you should have a good hen or a box-foster-mother ready to receive them.

BREEDS AND UTILITY.—The breeder delights in fine specimens of the breed he prefers, but many of those interested in poultry have no inclination to devote their time to

the breeding of beautiful birds only, but prefer to realise a profit from chickens and eggs, and hence any attempt to sacrifice vigour and strength in order to secure a straight comb or a certain shade of colour, receives but little attention from those who prefer poultry for eggs and market. It is difficult to secure a flock that is uniform in every respect. This is proved from the fact that, while the breeders of fancy poultry have been very exacting in their standard requirements about colour than any other class of breeders, yet they have not succeeded in securing a stock of uniform show birds from the best of their prize-winners, while the breeders of cattle and sheep, who give but few points to colour-marks, have only a small number of culls in their herds or flocks. The farmers who raise poultry for market, however, owe much to the breeders of fancy poultry, for despite all the mistakes they may have made, they have preserved the purity of the breeds, and the time will come when all the fancy breeds will combine the characteristics of utility.

PURCHASING FOWLS.—After you have purchased a fowl or fowls, and they arrive at your yard, don't jerk them out and judge immediately whether or not they are satisfactory or suitable. Remove them from the coop and place them in a quiet place by themselves. They have been cooped up and roughly handled for some days, and are tired, hungry, excited and shaken up. Let them get rested, refreshed and groomed a bit before you judge them. Fowls are somewhat human. Ride from Bombay to Calcutta yourself, in a drawing-room car if you please, and the first thing you want is a good cleaning

up, something to eat, and resting up somewhat before you go out to attend to your business. You want to make a good impression, don't you ? . Then, why not give the fowls a chance ? This may not seem of very great importance to some, yet it " cuts lots of ice," as the Yankees say, and you know 'tis the little things that count. People improve sometimes, when you are better acquainted with them, and 'tis so with fowls.

CHAPTER IX.

REARING CHICKENS.

A VERY great deal depends upon the way chickens are treated during their growing stage, for such treatment very largely controls their size and stamina. A large percentage of chickens die from sheer neglect or mismanagement. Chickens of all breeds cannot be treated alike or kept in the same coop. Chittagongs should be kept separate from chickens of other breeds ; if kept with other chickens, both the Chittagongs and the others will suffer. The Chittagong, the Game, the Langshan, the Rock, the Orpington, the Wyandotte and the Silkie should be kept each separate from the others. The Brahma and Cochin may be reared together, but even they do better when kept separate. The Chittagong, Game, Langshan and Silkie must not be kept confined ; they need large runs, plenty of exercise and extra animal food. They must also be carefully protected from damp, wet and the hot sun. The Rhode Island Red, Rock, Orpington and Wyandotte do not need as much liberty as the Chittagong or Langshan, but they must have a great deal of liberty and need to be carefully protected from damp, wet and the hot sun, and also need greater care in feeding. The Silkie does best when allowed to run at liberty with its mother and fed on rice and wheat. The Brahma and Cochin can be

kept more confined as they are heavily feathered, and are not so active, but even they should not be confined too closely ; they need more nourishing food and to be fed oftener, but little at a time. After they are a week or ten days old they need more liberty. The reason why each breed of chickens needs to be kept separate is because some breeds grow faster and develop quicker than others, and some are more active and quarrelsome than others, and each breed needs different treatment. If all are kept together, the backward and less active ones will suffer, and the forward and active birds will be injured.

THE FIRST FEED.—For nearly thirty-six hours after hatching chickens require no food ; but it is not advisable to leave them longer than thirty hours without it. Thirty hours after the chickens are hatched, they must be taken out of the old nest, and, with the mother, placed in a clean box, or put on the clean floor under a basket, in a warm, dry and quiet corner. The mother must be fed apart from the chickens ; a liberal supply of good whole grain wheat must be given to her. After the mother has been fed, she must be allowed a good drink of water, and then put with her chickens on the floor under the *tappa*, or in the box. Care must be taken that the chickens do not swallow the grain given to the hen, which, if they do, will stick in their throats. I do not now feed my chickens on hard boiled eggs, because I find they thrive better without it. If given at all, the egg should be mixed with some coarse oatmeal or wheat-meal ; if given alone, it is liable to cause indigestion and diarrhoea. The best

food for the first three days is stale bread-crumbs moistened with milk, and oatmeal and *khudi* (finely broken rice) given alternately. The oatmeal should be given very sparingly. Morton's oatmeal is the best for this purpose. This should be scattered on the board upon which the chickens are placed. The hen will call out the chickens from under her, and they will soon begin to pick up the food. A very small quantity only should be given at a time. The food must be given little and often—every two hours. Care must be taken that the board or ground upon which the food is given is quite clean. A handful of coarse sand or finely-sifted grit must be scattered on the board on which the chickens are fed.

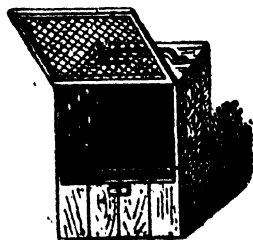
HOW OFTEN TO FEED THEM.—Chickens must be fed from six to eight times a day until they are six weeks old ; after that, and until they are six months old, they must be fed four times a day. The first feed every day must be given a little before sunrise. The last meal must be given at between 8 and 10 o'clock at night. I feed them by lamp-light. Only as much as the chickens will eat up at once should be given at a time. Nothing should be allowed to remain on the feeding board.

WHAT TO FEED CHICKENS ON.—For the first three days give bread and milk and oatmeal and ground rice in very small quantities every two hours. After the third day the morning meal should consist of equal parts of finely ground oatmeal, barley meal, pea meal and whole wheat-flour, sufficiently moistened with milk so that it will not stick to the fingers when pressed and will easily crumble, or a little stale



METHOD OF TESTING FERTILITY OF EGGS.

Fig. 52.



HATCHING BOX, 18 inches square.

Fig. 53.

bread moistened with skimmed or fresh milk. The other meals during the day should consist of Morton's coarse ground oatmeal and ground wheat and broken rice given dry. A little cooked rice may be given once a day, mixed with wheat-bran, especially during the hot weather. The ground grain may be given steeped for an hour in milk or hot water.

During the hot weather I give very little oatmeal, and a great deal of wheat and rice. At first the grain should be ground very small, but as the chickens grow larger the grains should be larger, until at two months of age they receive whole rice and broken wheat. A very small quantity of "Poultry Powder" given in the soft food to chickens will prove very beneficial.

Twice a week a little finely-chopped onions and garlic should be given. After the sixth week some finely-chopped half-cooked meat and raw onions mixed with wheat-bran must be given every other day. Do not give raw meat. White-ants and earth-worms are very good for chickens; they eat them greedily and should be given every day. When a good supply of white-ants is given, the meat is not necessary. Finely-ground fresh bones must be given when neither meat nor white-ants are obtainable. Chickens fed on white-ants thrive well and grow rapidly. Some fine sharp flint grit, charcoal and pounded old mortar must be given to the chickens every day along with the grain on the feeding board; sharp grit is indispensable.

Oil-cake is very good for growing chickens. After they are three months old they should be allowed some

mustard seed oil-cake or linseed oil-cake with their food once a day. Some chickens will eat it by itself if mixed with water and left in a plate ; but the best way to give it is to pound the cake up into powder and mix it with water, allow it to stand for two or three hours and then mix it with the rice or bran. Give only a small quantity.

Chickens must be allowed green food from the second day of their life ; without it they will not thrive. Young tender mustard cress or lettuce or tender *doob* grass is the best for young chickens.

I have found the following plan do very well with my six weeks old and older chickens :—First meal in the morning, equal parts of whole wheat-flour, barley-flour, pea-meal and oatmeal mixed with milk or butter-milk ; second meal, uncooked rice ; third meal, coarse ground wheat ; fourth meal, boiled rice, or wheat-flour with oil-cake, or else finely-chopped boiled meat with onions or lettuce ; fifth meal, coarse ground wheat. I give only as much as the chickens will eat up at once, and allow nothing to remain on the board.

WATER.—Chickens must not be allowed water for the first three days when they are fed on eggs. If egg is not given, water may be allowed on the second day. On the fourth day, and every day after that, water must be given regularly from four to six times a day. After the chickens have had a good drink the water vessel must be removed.

The water must be perfectly clean, and given in a shallow vessel. The following plan is a good one :—

Fill a cup with water, put a saucer over it turned upside down, and turn the cup and saucer over. The cup will now stand topside down in the saucer, and there will be a rim of water all round in the saucer. This will give an ample supply to the little creatures, without the danger of their drowning themselves or polluting the water with their dirty little feet. The cup must be without a handle. Any similar contrivance will do. The two things necessary to guard against are the chickens drowning or wetting themselves, and their polluting the water.

The water must be given always before the grain is given and removed after the chickens have drunk sufficient.

A few drops of Condry's Fluid, or a small quantity of Permanganate of Potash should be added to the drinking-water every day. This will prevent a great deal of sickness and trouble. The quantity of Permanganate of Potash should be only sufficient to colour the water a light pink. A few drops of Parish's Chemical Food should occasionally be added to the drinking-water. Occasionally a little camphor water put into the water will be beneficial.

GREEN FOOD.—Chickens need green food from the second day after they are hatched. They are very fond of tender green *doob* grass, and they need nothing better. From July to November they will find all the grass they need ; but during the cold weather and dry hot weather grass will be scarce and some green food must be provided. Nothing

can be better than lettuce leaves and young onions chopped very fine. Onions should be given in very small quantities and only two or three times a week, but lettuce can be given every day with benefit. Sometimes chickens get diarrhoea from eating too much fresh green grass or too many onions. Lettuce never does any harm. Mustard cress is also very good for chickens. I have also found finely chopped tender leaves of the *Bael*, *Neem* and *Puppea* trees very beneficial for larger chickens, but these should be given in very small quantities.

ANIMAL FOOD.—Animal food in some form is absolutely necessary for chickens. White-ants are unquestionably the best thing that can be given to them; in the absence of white-ants, boiled meat or clean freshly ground bones must be provided. The entrails of the goat or sheep are the best meat to give. The tripe should be properly cleaned and boiled and minced finely before it is given. Fresh bones cleaned and pounded into powder is also very good for chickens. A small quantity of freshly ground turmeric should be mixed into the meat or ground bones before it is given. Turmeric given in small quantities is a preventative against disease. Milk and curds are splendid food for chickens. White-ants and milk can be given every day from the first day, and meat and bones should be given when they are a month or six weeks old and then not oftener than every other day. During the rains the chickens, if allowed their freedom, will pick up all the animal food they need, but during the hot weather and cold weather, when animal food is not

very abundant in the fields and gardens, some must be provided.

GRIT.—Chickens must be provided with some coarse sand, fine gravel and finely broken and sifted flint. A small quantity may be placed on the feeding board, or else a large quantity placed in an open box in the run. It must never be mixed with the food.

MIXTURE OF FOOD.—The following make a splendid mixture of soft food for chickens from about two months of age :—

Whole wheat-meal	..	.. two pounds.
Finely ground barley	..	.. one pound.
Finely ground gram or peas	..	.. two pounds.
Finely ground rice	..	.. three pounds.
Wheat-bran	..	.. three pounds.
Linseed-meal	..	.. one pound.
Precipitated Phosphate of Lime	..	.. half pound.

Add a tablespoonful of Poultry Powder. All should be properly mixed together. Give moistened with butter-milk or skimmed milk. Make into a crumbly state and give only a little at a time twice a day. The principal grains for chickens should be coarsely ground oatmeal and coarsely ground wheat and rice. *Doob* grass and lettuce are the best green food. Give the grain dry and on clear ground.

COLOUR OF CHICKENS.—Don't condemn your chickens. Many inexperienced breeders not knowing that the chickens of some varieties are not true to feather when first hatched,

jump to the conclusion that they have been swindled, and make a great ado about nothing. One must live and learn.

NEGLECT.—Many amateur poultry-raisers neglect their chickens when they get to be eight or twelve weeks old for the younger broods. This no doubt is because it is thought such chickens can look out for themselves better than the smaller ones, and so they can to a certain extent, but neglect at this period of their lives often results fatally. The reason that care should not be remitted, at this time especially, is because the down or nest feathers which heretofore have enveloped the body are being shed and full-grown feathers are taking their place, thus causing a constant drain upon the system. It might rightly be called the "first moult" and of course one can readily understand there is not the strength to meet this in the young chicken that there is in the adult fowl, therefore let there be no relaxation in care and attention while our feathered pets are donning their new clothes. Animals shed their coats. Dame Nature has provided for the renewal of the covering of birds, fishes, insects, and reptiles also, and in this "getting on of new coats" fowls are included. The old feathers gradually fall off and the new ones take their place with an added lustre and silkiness of texture that is pleasant to the eye of the onlooker and comforting to our pets themselves.

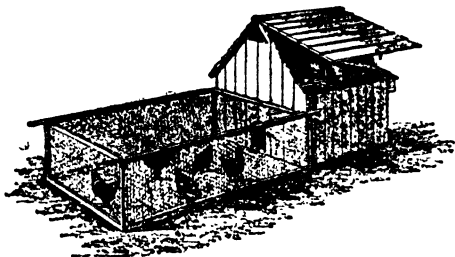
CLIPPING WINGS.—The wings of growing chicks require an occasional clipping. The wings grow so rapidly on such breeds as the Leghorn, Chittagong, Langshan and some others, that all the life and vitality of the chick are exhausted

thereby, and many die from this cause. I have clipped the feathers of many chickens after they had begun to droop and they soon recovered, and grew strong and lively.

EXAMINE THE VENT.—Chickens are often troubled with diarrhœa. The passage at the vent becomes stopped up. The chicks suffer much pain and begin piping, and, if not attended to immediately, will die in great agony. Examine the vent, remove the excrement from around the vent, bathe the part with warm water and Permanganate of Potash, dry with a soft cloth and apply some vaseline or salad oil. Keep the bird separate for a day or two in a dry place. Put a few drops of olive oil down the throat and feed on bread and milk.

OVERFEEDING.—One of the greatest dangers of chickenhood is overfeeding. If adult fowls are kept in confinement and overfed, they will become overfat and cease to lay or they will be troubled with diseased liver and fatty degeneration of the heart. When young chickens, before they are old enough to digest the food, are given a large quantity of food at one time, they will not be able to assimilate it and will get their stomachs and livers deranged. A very large number of chickens are killed by injudicious and excessive feeding. The proper method is to feed every two hours or so and give only small quantities that can be eaten up at once. Then, again, very young chickens must be given only such food as they can digest : food of too heating and stimulating a nature is injurious. After chickens are three months old there is less danger of overfeeding ; between three and eight

months is the period when they grow rapidly and fledge out fully, and they can assimilate larger quantities of food. At this time they need extra food of good bone and muscle-making substances. If the method of feeding mentioned in the previous section is followed, there will be no danger of overfeeding or underfeeding.



BROODER AND RUN.—Make the box three feet square, with wood bottom, top and sides, as per illustration. A door made of a wooden frame and wire-netting must be fixed in front. There must be proper ventilation, but no draughts. The run should be six feet long and three feet wide, and 21 inches high. Make a wood frame, nail wire-netting on the three sides and top, over the netting place some thin canvas or cloth, so as to keep the wind out during the cold and windy weather; put a mat or gunny on the top of the run during the day to protect from the sun. Such a box and run will do well for a hen and 12 chicks, or for 18 chickens alone for the first month.

THE RUN.—For the first three days the chickens must be kept with the mother under a small *tappa* or in a box

during the day. If the day is bright and the ground dry the *tappa* should be placed on short grass in the compound. But if the ground is wet, or the weather damp, they must be put in a box with sand or dry earth in the bottom, and kept under a shed. For the first three days chickens need to be kept in close confinement; because if they are allowed to run about much their strength will be overtaxed. On the fourth day they need a little freedom, and must be placed under a *tappa* or run three feet in diameter. On the fifth day they must be removed to a proper run. A run six feet long, three feet wide and twenty-one inches high will be sufficient for a dozen chickens until they are a month old. The illustration gives a good idea of the run required. The covered box or coop must be attached to the run to protect the chickens from the rain and the heat of the midday sun. Such a run will save a world of trouble and anxiety, and prevent the brood wandering and getting tired before they are old enough to bear the strain. After the chickens are a month old they should be let out with their mother for two hours in the morning and evening. When they are six weeks or two months old, they must be allowed out the greater part of the day. The run must be shifted every day and placed on fresh grass. The chickens must be protected from the heat of the sun, as a large number die from sunstroke. During the hot weather the runs and coop must be placed under the shade of trees or covered over with thick mats or gunny.

If chickens are kept in close confinement, they will droop and die. When kept confined long, they begin to pipe,

and this will prove injurious to their health. They must be kept contented and happy, and they are most contented and happy when they run about and scratch for themselves. When chickens are six to eight weeks old, they should be allowed perfect liberty with their mothers. Only during the hottest part of the day and during wet weather should they be kept closed up in their coop and run. It is best to keep the chickens in their coop or in their run during the morning, when the grass is wet with heavy dew. But the earlier they are let out, the better.

SHADE.—Chickens should be carefully protected from the sun and hot winds. A large number of valuable chickens die from the effects of the heat. The run must be placed in the shade in a cool place, and there should be plenty of large shrubs and small trees on the ground under which the chickens can run about and take shelter and scratch during the day.

CROWS AND KITES.—The greatest enemies chickens have in India are crows, kites and hawks. One cannot too carefully guard against them. Chickens must always be kept under a covered run, and, when let out, be watched by some person to protect them from these birds and cats.

AT NIGHT.—The chickens with their mother must be properly cooped at night so as to be safe from cats, rats and thieves, and kept away from draughts and wet. The coop must be large enough and sufficiently ventilated to be comfortable. Damp, dirt, overcrowding and want of proper ventilation are fruitful causes of disease.

A couple of inches of dry earth or sand must be placed in the coop on the wooden floor.

KEPT SEPARATE.—The hen with her brood must be kept away from the other fowls, or else she will be constantly fighting, and injure or destroy the chickens. Two hens with chickens must not be kept in the same run, or very close to each other ; for they will fight, and peck each other's chickens to death.

Chickens of different sizes must not be kept together. The larger ones will ill-treat the younger ones and injure them permanently. Nor should chickens be kept with adult birds. When chickens of the same size, age and breed are kept together in small numbers in a good run and large pen, they thrive very well.

INJURIOUS PRACTICES.—Some people remove the little horny scale which appears on every chicken's beak ; they have an idea that this will enable them to pick better. This practice is as stupid as it is useless, and often proves positively injurious to the little birds. Another foolish and hurtful practice is putting food or pepper-corns down their throats, and dipping their bills in water to make them drink.

The best thing to do is to *leave them alone*, and let them pick up their own food.

GROUND.—Experience has proved that it is almost impossible to rear chickens on ground that has been contaminated by full-grown fowls or continuous broods of chickens. Chickens will never thrive on ground upon which ducks, geese or turkeys have been kept. New ground or ground

properly dug up and turned over is the best for chicken rearing. The chickens' runs must be large, clean, shady and with a lot of good *doob* grass growing on it. Once a year, at least, the ground should be dug up and the earth properly turned and a large quantity of sharp flint grit, slaked shell lime and old mortar scattered over the ground. If possible, a crop of mustard should be raised on the ground every cold weather.

CLEANLINESS.—Absolute cleanliness is very essential, even more so than for grown-up fowls. If the boxes, coops, grounds and runs are allowed to become tainted with their excrements and stale food, it will be impossible to successfully rear them. The sand or earth in the coop must be continually changed, and the run moved every day to a fresh place.

VERMIN.—Chickens will not thrive if they are covered with vermin. The best way to keep them free from insects is to rub some Keating's insect powder on their heads, bodies and under their wings; and to occasionally wash their boxes with a strong solution of Phenyle and water, and dry in the sun. If the coop, house and run are not kept perfectly clean it will be impossible to keep the chickens free from vermin. Paint the boxes and all the woodwork with seven parts of kerosene oil and one part of coal-tar, Stockholm-tar is better, properly mixed together.

WET AND DAMP.—If young birds are kept in wet or damp spots, they cannot thrive. Wet and damp cause a great many deaths among chickens. They should never be allowed out during unsettled weather.

HOUSE AND RUN FOR CHICKENS.

RUN.

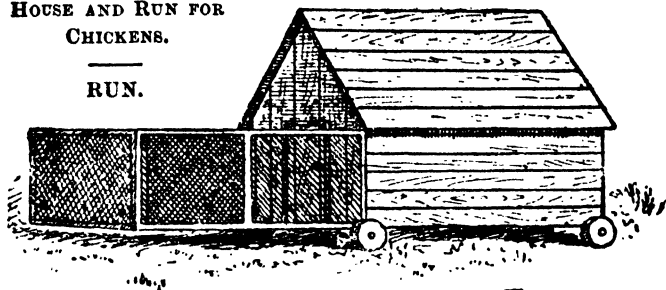
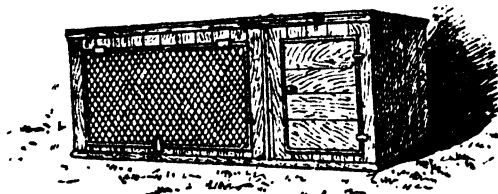


Fig. 55.

Chickens, coop, with wire run, which may be left out at night without fear of jackals or cats. There should be a lid to the coop to get at the hens and chickens and for cleaning the coop, which should have a bottom and a piece of gunny thrown over the wire-netting during bad weather and at night. The above is a most useful construction, and is a protection not only against animals but kites and crows. Though a little expensive, it will repay itself well.



COOP WITH COVERED RUN ATTACHED
FOR CHICKENS.

Fig. 56.

PERCH.—Chickens under nine months of age should never be allowed to roost on perches. Doing so will make their breast-bones crooked and will disfigure them for life. Chickens should be bedded on a thick layer of sand or dry loose earth. The sand and earth should be sprinkled over with flower of sulphur and with kerosene oil or a strong solution of Phenyle.

COOPS AND HOUSE.—It is best to keep only ten or twelve chickens in each coop at night. A coop for twelve chickens between three and six months old should be six feet long, three feet wide and two feet deep. The top, sides and front should be covered with half inch mesh wire-netting, the bottom should be boarded, and the front should have a door for the chickens to get in and out. The coop should be kept in an open godown or sheltered shed. Only chickens of the same age and size should be kept together. When kept in this way, they thrive nicely. After the chickens are six months old, they should be allowed to roost in a fowl-house.

The coops should be kept very clean and kerosene oil and tar constantly applied to all the woodwork.

WEEDING OUT THE STOCK.—A most important factor in successful poultry-keeping is to avoid overcrowding. In those yards where chickens are reared chiefly for the table, they are disposed of as soon as they are fit to eat, and the weeding out process is carried on all through the season. The tendency, in fact, under these conditions, is rather to diminish the stock too much. It is forgotten that some of

the January—March pullets ought to be retained as the principal birds to be looked to for eggs in the winter. In many yards, where a good many chickens were to be seen in January and February, there are in October and November only a few late hatched young ones, the older chickens all having been killed or sold : a clear case of killing the birds that would have laid the golden eggs. With those people, however, whose space is limited and who keep pure-bred fowls, sometimes with a view of exhibiting, there is a disinclination to reduce the stock for fear some of the birds disposed of may ultimately turn out well. And even if the chicks have no pretence to good looks, the fact that their growth has been watched from day to day, and that they have been made pets of by the owner, causes him to be unwilling to part with them.

But the health of the poultry is bound to suffer, as well as the profit side of the account, if the stock is not reduced to reasonable dimensions. Sentiment must be discarded if the fowls are to be kept on business principles, to realise the greatest possible profit. Some chickens when two months old will show very marked defects, others will not develop their true qualities until they are four or six months old. Whenever it is seen that a chicken is very defective and unfit to use in the breeding pen, it should immediately be sold for table purposes or killed for dinner. The hens that are three years old should be got rid of before they begin to moult. It is better to take a rupee or two for each, which is generally the most that can be obtained for old hens, than to feed them

for months, when they are not paying. Of course, if a bird is specially good from a fancy point of view, she should be kept on longer, though for laying a larger number of eggs a hen will have seen her best days by the time she is three years old. Neither is it advisable, except under special circumstances, to keep the cock birds after they are four years old. They often remain a long time in the moult when they are of that age, and are of little use until February and March.

In arranging to reserve certain birds and to weed out others, the composition of the flock for the ensuing breeding season must be taken into consideration. It is a mistake to keep young birds only. If both the parents are only a year old, the chickens from such an alliance fledge more slowly, mature less quickly and seldom grow as large as those that are bred from three or two-year old hens, mated with a cockerel, or from a three or two-year old cock running with fine, early hatched twelve months old pullets.

Some extra birds must be kept to be put in place of those that leave the breeding pens.

THINGS YOU OUGHT TO KNOW.—Chickens of all black breeds such as the Black Langshan, Black Orpington, Minorca, etc., when first hatched, have a great deal of white and yellow about them, but these feathers are gradually changed for pure black ones.

The largest birds do not lay the largest eggs. The largest eggs do not produce the largest fowls. The size or colour of the egg does not indicate the breed of the bird that laid it.

The Barred Rock, Dark Brahma, Laced Wyandottes and other partly-coloured chickens when hatched are very different in colour to the parent birds, but they gradually assume their proper colour.

Pure black birds frequently produce pure white chickens. The White Langshan was produced from the Black Langshan, the White Minorca from the Black Minorca.

The Buff varieties are inclined to breed very light and even white.

You cannot tell the freshness of an egg by shaking it ; if you shake an egg or place it in water, you will destroy the chance of its hatching.

Locality, food, weather, house and run, and the treatment you give the birds will affect the production of eggs.

All improved breeds among birds and animals (also human beings) have the tendency to throw back and revert to the type of the original parents from which they were produced. So variations in breeding must be expected. Special points in size, form, colour and laying or table qualities can be fixed in poultry only by continuous and careful selection and breeding for those points.

CHAPTER X.

ARTIFICIAL HATCHING, AND REARING BY HAND.

HATCHING.—All poultry-keepers have at times been troubled with hens that were bad sitters. It is exceedingly provoking to have a setting of eggs spoiled ; also frequently when there are a number of good eggs which should be set it is difficult to procure a broody hen. All these annoyances are done away with by the incubator. Artificial incubation is no longer a mere theory. In these days it has reached a state of perfection that is almost astonishing. In these machines a large number of eggs can be hatched at any time and season of the year and almost as successfully as by hens.

In hatching by incubators it is of the utmost importance that the eggs be fresh ; they should not be more than three days old in the hot weather and seven days old in the cold season. If stale eggs are placed in the incubator, the probabilities are they will not hatch. Another thing to be guarded against is the proper regulation of the heat in the incubator. In the plains of India the heat should be only between 101° and 103° ; less will be ineffectual, and more will be injurious. It is needless for me to say much here about the method of working incubators. Different machines

are differently constructed, and a book with all required directions about regulating and working the machine is given with each incubator. But there are a few hints that should be carefully borne in mind. First, care should be taken about proper and sufficient ventilation. The drawers should be opened twice a day and the eggs exposed the full length of time,—that is, at the beginning of incubation for ten minutes, and after the tenth day for twenty minutes or until the eggs are cool. Second, do not allow the light to smoke. Third, never allow the heat to rise above 103° ; keep as close to 102° as possible. During July, August and September the heat will frequently rise very high. In order to keep it down to 103° I have been obliged to extinguish the light in the lamp and keep the machine without a light for two and three days at a time. This was specially the case during the week or so before the chickens were due to hatch. The eggs remained warm and the heat was maintained at the required point without the light for two or three days, but as soon as the temperature began to fall below 102° I lighted the lamp again. Fourth, during the hot weather moisture is needed, but during the rains no moisture is needed. I have worked my machines successfully all through the rains without any water in the trays. During the cold weather a little moisture is required, but even in the cold weather the machines may be successfully worked with very little moisture. Fifth, the machine, the egg-drawer and water tray must be kept scrupulously clean. After every hatch the egg-drawer, water tray and canvas must be properly washed with boiling water and

Permanganate of Potash. Sixth, do not open the egg-drawer often during the time the chickens are breaking through the shells. They will become chilled.

One of the best machines of the kind is that known as Hearson's Champion Incubator, made by Chas. Hearson & Co., Ltd., 235, Regent Street, London, W.

I have used Hearson's Ostrich Incubator No. 35, to hatch fowls', ducks', turkeys' and geese's eggs with great success, and I think this machine is the very best for India. There are also some other and cheaper incubators that give very satisfactory results. Some American incubators are very good and cheap.

REARING.—It is, doubtless, very provoking to have a setting of egg spoiled, but it is even more annoying, when the chickens have been hatched and are strong and lively, to find some of them crushed to death by their clumsy mothers, and others dying for want of proper care from their mothers. Hence many attempts have been made to solve the problem of rearing by artificial means. Foster-mothers and Cold-brooders are the best contrivances to take the place of the mother hen, and, with proper care and cleanliness, they can be worked successfully in India. When chickens are hatched in an incubator, they must be removed from the machines as soon as they are dry. Some of the incubators have drying boxes for chickens just hatched. When the chickens are hatched, they must be taken from the egg-drawer and put into the drying-box and kept there for from twelve to sixteen hours, when they must be removed to the foster-mother. Care must be taken that the drying box and foster-mother are not too

warm, and that there is sufficient ventilation. The heat must not be more than from 90°. No water must be kept in the machine, and there must be free circulation of air through the machine. If the foster-mother is allowed to become too close and warm, the chickens will become ill and die. Only 12 chickens should be kept in India in machines made to hold 50 in England.

But there is a simpler and cheaper method of rearing chickens by hand, which is better adapted to India, especially when the chickens are hatched from November to April. After the chickens are hatched, they must be allowed to remain with a hen for three or four days. The animal heat from the hen is very necessary for the chickens. If an incubator is used, the chickens should be kept in the drying-box for the first three days. The lid of the drying-box must be kept an inch or so open, in order to give plenty of ventilation. The chickens should be taken out of the drying-box and fed; after feeding them they should be again placed in the drying-box. They should be fed every two hours, and only a little given at a time. They must be fed as directed in the previous chapter. On the evening of the third day after they are hatched, the chickens will be strong enough to run about, and will be able to eat properly. They should now be taken from the hen or drying-box and placed in the box foster-mother described below.

The next morning the chickens must be taken out of the box foster-mother and placed on a clean plank under a small *tappa* or run, or in a large open box; some food should be

thrown from a little above their heads down on the plank. At first those taken from the hen may not eat, and will keep crying for their mother, but repeat throwing the food, and a few of the chickens will begin to pick up and eat the little pieces, and gradually the others will do the same. As soon as the little creatures stop picking and running about, they must be put back into their box and kept quiet for two hours, when they must be taken out and fed again; after which they must be again put back. They will enjoy the warmth and go to sleep. This process must be repeated every two hours until the chickens are a week old. On dry sunny days they must be left out in the open on the dry green grass under a small run for two or three hours in the morning and evening. It is a good thing to put the chickens out on the dry green grass for an hour or half-hour from the second or third day they are hatched.

I have already, in a previous chapter, spoken about the food and water for chickens; it is not necessary for me to add anything further about it.

Chickens should never be placed out on a wet, stormy or windy day. If the sun be too hot for the chickens, a piece of canvas or mat should be thrown over half of the *tappa* or run. When the weather is unsettled, the chickens should be placed in a large box with the top open, in a warm corner in the shed; some clean sand or dry earth should be put in the box.

For the first three days a *tappa* or run two or three feet in diameter will be sufficient for a dozen chickens to run in.

On the fourth day they will need a little more room. After they are seven days old they must be placed in a proper run out on the green grass in the sun for three hours in the morning and three hours in the evening. A run, six feet long and three broad and two feet high, will be large enough for a dozen chickens. When six weeks old, they must be allowed perfect liberty in the open, but must have some person to watch them and guard them from crows and kites. Until they are eight weeks old chickens should be confined under a small run or in a box for two or three hours during the middle of the day ; this rest will do them much good.

BOX FOSTER-MOTHER.—For the first three days the chickens should be allowed to sleep under their mothers or in the drying-box of the incubator. Great care must be taken to allow sufficient ventilation in the drying-box. On the third night they should be put in a box made as follows :—**Make a box two feet long, eighteen inches wide and eighteen inches high, cover the top with half-inch mesh wire-netting, put a door on one side of the box, made of a wood frame and half-inch mesh wire-netting ; to the wire-netting on the top of the box attach strips of flannel, the strips being two inches wide and hanging down to one inch of the bottom of the box ; place these strips two inches apart ; on the bottom of the box place one inch of clean coarse sand, and over this some soft dry cut straw on coarse saw-dust $\frac{1}{2}$ inch deep.** When the chickens are placed in this box, they will go in between the flannel strips and nestle there as they would under the hen's wings. When the night is cold throw a piece of cloth

over the door and half of the top of the box. This box makes a capital foster-mother. It will be sufficiently large for two dozen chickens of a week old ; as the chickens grow larger, fewer of them must be kept together ; not more than six chickens, six weeks old, must be kept in a box of this size. The wire-netting on the top and the door at the side will give ample ventilation and the flannel will give all the warmth required. I prefer to put the chickens in this box as soon as they are removed from their mothers.

When chickens are hatched under hens, they must be properly rubbed over with Keating's insect powder when they are twenty-four hours old, and again when they are removed from under their mother and before they are placed in the box foster-mother mentioned above. If lice are allowed to remain on chickens, they will not thrive. The box and the flannel must be washed with Phenyle or Jayes' fluid and water, and dried in the sun at least once a month, and the chickens occasionally rubbed with insect powder.

After the chickens are eight weeks old they should be kept in a large box-house on clean dry hay or sand. In calculating space for chickens above eight weeks old and under four months old, you must count two chickens as equal to one full-grown fowl.

The chief difficulty in rearing chickens by hand is keeping them contented and happy. It is not difficult to feed them and give them warmth, but it needs a great deal of time and care to keep them from becoming restless and from piping. For the first week chickens brought up by hand

give more trouble than those reared by a hen, but they soon get very tame and are easily managed. Only chickens of the same age and breed must be kept together.

If there are only a few chickens, and the hens be good mothers, it will not be wise to take them away from them. A hen can manage from 6 to 8 chickens very well in the cold weather, and from 8 to 16 in the hot weather. But if there be more chickens than two or three hens can properly manage, it will be best to rear them all by hand. It will be less trouble and expense to rear a hundred chickens by hand than to look after half a dozen hens with their broods.

Overcrowding must be guarded against. If too many chickens are put in a box, or if the box is too close and warm, the chickens will become ill and die of roup or small-pox. Then, again, chills must be strictly guarded against. If the box is not sufficiently warm, the chickens will get chilled. The temperature in the box should be 90° for the first few days, and 80° later on.

CHAPTER XI.

MANAGEMENT OF LARGER CHICKENS, CAPONISING, MANURE, AND FATTENING FOWLS.

LARGER CHICKENS.—Inexperienced persons are very apt to make a great mistake in rearing chickens, by neglecting those between a month and eight months old for the younger brood. They think the birds are old enough to look after themselves, and do not require the same amount of care as the younger ones; whereas the fact is, that the birds need more care when they are between a month and eight months old than they ever did or will, and any neglect at this period will be attended with serious results. At this time the down or nest feathers are being shed, and full-grown feathers take their place. This causes a continual drain upon the system, and the birds need greater warmth and extra nourishment, and require to be carefully guarded against exposure to cold and wet.

Chickens under eight months old must be fed four times a day, and allowed at each meal as much as they will eat; generous feeding will produce good birds.

Wheat, barley-meal, oat-meal, oil-cake, paddy, gram, peas, green grass and some animal food are the best articles of food for young and growing fowls. The wheat, paddy, gram and peas should be crushed or broken and steeped

for a few minutes in hot water before they are given to young birds. Ground bones and white-ants should be regularly given.

Particular attention must be given to cleanliness of their boxes, house and run or yard. Dirty soil and filthy houses will soon kill the birds.

I have already spoken about the space needed for larger chickens, and also about giving them a bed of dry sand to sleep on.

I must repeat that it is very necessary to keep the cockerels and pullets in separate houses and yards. When the cockerels are three or four months old, they must be removed from among the hens and pullets and kept by themselves until they are 10 months or one year old.

Care should be taken to keep only cockerels of the same breed and age together. If birds of different sizes are kept in one pen, the older birds will ill-treat the younger ones and do them a great deal of damage. If cockerels under six months of age are put together at the same time in a pen and run, they will grow up together and live in peace. Game and Chittagong cockerels are more active and quarrelsome than cockerels of the other breeds, and must be kept separate or else they will ruin the other birds. They must not be crowded. Give them as much room in the house and run as you should give adult birds.

Cockerels are ready for the table when they are between four and six months old. It is advisable at this period to weed out all the defective birds—such as are very much

mis-marked, and all such as have their tails, backs, beaks, legs, toes, wings and necks crooked, and all undersized and weakly ones. All these should be either killed or sold for the table. After this, select the best birds, and keep them separate for replenishing the breeding-stock. When the worst and the best have been separated, keep the rest by themselves for another two or four months, when you can go over them again and make your final selections, keeping those you want and selling the rest. Those selected for breeding must be treated with great care, and when twelve months old they must be mated with selected hens.

The pullets will be ready for the table when they are five or six months old, and should be weeded out in the same way as the cockerels. The inferior birds should be either sold or used for the table; and those intended for the breeding pens must be kept in separate pens and properly treated. When they are between ten and twelve months of age, mate them with cocks that are at least a year older. The instructions given in the chapter on breeding must be faithfully adhered to.

CAPONISING.—Caponising is the taking away from cockerels the power of reproduction. By this means the weight of the birds and the tenderness of the flesh are greatly increased. The operation should be performed in the cold weather, and when the bird is between four and six months old.

The following description is a translation of a French treatise :—

“ The instrument employed in the operation should be very sharp; a surgeon’s small operating-knife, termed a

curved-pointed bistoury, is far better than an ordinary knife, as it makes a much neater wound, and so increases greatly the chances of healing; or a curved-pointed pen-knife may be used. A stout needle and waxed thread are also requisite; a small curved surgical needle will be found much more convenient in use than a common straight one.

“It is necessary that there should be two persons to perform the operation. The assistant places the bird on its right side on the knees of the person who is about to operate and who is seated in a chair of such a height as to make his thighs horizontal. The back of the bird is turned towards the operator, and the right leg and thigh held firmly along the body, the left being drawn back towards the tail, thus exposing the left flank, where the incision has to be made. After removing the feathers the skin is raised up, just behind the last rib, with the point of the needle, so as to avoid wounding the intestines, and an incision along the edge of the last rib is made into the cavity of the body, sufficiently large to admit of the introduction of the finger. If any portion of the bowels escape from the wound, it must be carefully returned. The forefinger is then introduced into the cavity, and directed behind the intestines towards the back, somewhat to the left side of the middle line of the body.

“If the proper position is gained (which is somewhat difficult to an inexperienced operator, especially if the cock is of full size), the finger comes into contact with the left testicle, which in a young bird of four months is rather larger than a full-sized horse-bean. It is moveable, and apt to

slip under the finger, although adhering to the spine ; when felt, it is to be gently pulled away from its attachments with the finger and removed through the wound—an operation which requires considerable practice and facility to perform properly, as the testicle sometimes slips from under the finger before it is got out, and, gliding amongst the intestines, cannot be found again readily ; it may, however, remain in the body of the animal without much inconvenience, although it is better removed, as its presence is apt to excite inflammation.

“ After removing the left testicle, the finger is again introduced, and the right one sought for and removed in a similar manner. It is readily discovered, as its situation is alongside of the former, a little to the right side of the body. Afterwards the lips of the wound are brought together and kept in contact with two or three stitches with waxed thread. No attempt should be made to sew up the wound with a continuous seam, but each stitch should be perfectly separate and tied distinctly from the others.

“ In making the stitches great care should be taken ; the skin should be raised up so as to avoid wounding the intestines with the needle, or including even the slightest portion of them in the thread—an accident that would almost inevitably be followed by the death of the bird.

“ After the operation the bird had better be placed under a coop in a quiet situation, and supplied with drink and soft food, such as sopped bread. After a few hours it is best to give him his liberty, if he can be turned out in some quiet place removed from the poultry-yard, as, if attacked

by the other cocks, the healing of the wound would be endangered.

“ After the operation the bird should not be permitted to roost on a perch, as the exertion of leaping up would unquestionably injure the wound ; it should, therefore, at night be turned into a room where it is obliged to rest on the floor previously covered with some clean sand. For three or four days after the operation the bird should be fed on soft food, after that time it may be set at liberty, for a short period, until it has recovered entirely from the operation, when it should be put up to fatten.”

The natives of India are adepts at caponising. Any man who knows how to do it will perform the operation for a few pice. I have paid one anna for each bird, sometimes more.

MANURE.—Fowl and duck manure is valuable for flower and fruit gardens, or any crop. It is too strong in its undiluted state, and must be thoroughly mixed with some fine dry earth before it is put on the ground. The manure should be collected in a pit or barrel, and kept some distance from the house.

FATTENING FOWLS.—Capon and young hens fatten the fastest. Growing chickens and old birds should not be put into the fattening-coop.

Only perfectly healthy and robust fowls should be selected. The birds selected must be kept each in a separate coop or compartment. These coops or compartments must be only fifteen to eighteen inches square and two

feet deep—no larger. The top, sides and back of the coop must be boarded up; the front enclosed with wire-netting or with bars. The fowls in the different coops or compartments must not see each other. The coops should be kept in a room that can be closed and made dark after the birds have been fed. If kept in the open, a canvas screen should be drawn before the doors. The bottom of the coop should be barred, and have a drawer underneath to receive the droppings. The droppings must be removed twice a day. The coops should be constantly painted over with kerosene oil or Phenyle to keep them free from vermin.

The best food for fattening fowls is Indian corn-meal, barley-meal and boiled rice, and, occasionally, wheat-bran or the inner husk of the rice mixed with boiled potatoes, vegetables and butter-milk. The meal and brans should be boiled till quite stiff and dry, and allowed to cool. The food should be changed occasionally. The fowls must be fed four times a day, and as much given at a time as they will eat. A constant supply of water is necessary.

A properly fed large fowl should gain 1 to 2 lbs. a week, and should be ready for the table in two or three weeks. Fowls fatten quicker in the warm weather than in the cold. Sometimes a fowl refuses to put on fat, and becomes ill when subjected to the fattening process. When it is observed that a fowl has not gained weight during the first week, it is best to kill it as it is.

CHAPTER XII.

THE INFLUENCE OF CLIMATE ON DOMESTIC FOWLS.

I HAVE alluded to some of the practical difficulties met with in breeding fowls recently introduced from other countries. From my own experience and from such study as I have been able to give the subject, I am convinced that the question of acclimatization is one of the most important to poultry-breeders, and one that is most generally ignored. The following article from *Farm Poultry* is well worth studying :—

“The subject, as a whole, considered as it affects both human beings and domestic animals and plants, is but little understood. While it is quite universally recognized that changed conditions, especially changed climatic conditions, often have a decided influence for better or for worse on both plants and animals, the nature and extent of such influences have not been studied enough to make possible the formation of any general laws of acclimatization. Scientific men are confident that investigation and time will demonstrate the existence of such general laws ; but at this date the mass of facts regarding the effects of climate and of change of climate on organic life, though considerable and most interesting, has furnished them only with hypotheses.

“It is a recognized fact among farmers and breeders that cattle and horses taken from one part of the country to the

other require some time (the average perhaps being about a year) to become so habituated to the new conditions as to bear them easily, and that the systems of some animals never become reconciled to the change.

“ Breeders and purchasers of the larger domestic animals, when buying stock, take this fact into consideration to a much greater extent than do breeders of poultry. So also do writers in the stock and agricultural journals. The subject of acclimatization is mentioned and discussed by them much more frequently than by poultry writers. It has been made *familiar* in connection with other stock.

“ Naturalists tell us that every change, however slight, in its surroundings, affects in some way the constitution of an animal. The organism having become habituated to existence under certain conditions, any change in these conditions necessitates corresponding changes in the system of the animal. These changes are not always even temporarily injurious. Sometimes the change seems to have an invigorating effect on an individual or a race, and it thrives far better than in its native location. Sometimes the change stimulates to unwonted activity to be followed by enervation. Sometimes it is injurious at first, but the prejudicial causes are soon overcome, and there is little apparent difference in vigour and fecundity between that part of a stock which remained in its native home and that introduced to a new environment. Sometimes the change is detrimental from the outset, and finally disastrous to the individuals subjected to it. These four classes are not separated by hard-and-fast lines. We

pass from one to another by almost imperceptible gradations.

“Coming now to the practical application of the question as directly affecting poultry and poultry-breeders. I believe that if the importance of this question were more generally recognized, and the nature and extent of the hindrances Nature places in the way of transportation of fowls were better understood, there would be ninety per cent. less friction in the business than there is to-day.

“Buyers and sellers of eggs and fowls ought to know that the change of conditions caused by transporting them even a short distance may mean the inauguration of constitutional changes, the exact nature and extent of which can only be conjectured, and which cannot by any known rule or method be controlled.

“We are not even able to select the individuals most likely to accommodate themselves to the change—because, so far as observation goes, there is absolutely nothing to guide in such selection. The change which benefits one fowl injures another. Of the two fowls, the one which best stands the change may be inferior in constitutional vigour. According to the best information obtainable, the ease with which acclimatization is effected depends not so much on stamina or strength, as on some peculiarity, some constitutional variation, or tendency to variability which enables some individuals to conform readily to certain conditions, and to adapt themselves with comparative ease to any changes of conditions.

“The resemblance of two localities in general climatic features does not, it would seem, furnish any assurance that fowls from one are specially suited to the other. According to the best authorities, organisms are affected by the mere fact of change; no two places are exactly alike; though the differences in climate may be imperceptible to us, their operation soon reveals their existence, and then, as we have seen, the ease with which each individual becomes acclimatized depends less on the extent of the change and the nature of the new environment than on his own constitutional capacity for adapting himself to change—to changes of any kind.

“As to whether acclimatization may be more readily accomplished at certain periods of life than at others, we know nothing definite. Theoretical reasons might be given in favour of one period or another, and some facts adduced in support of all the theories. Some have supposed that acclimatization would be effected best by purchasing eggs; that chicks hatched in the new locality became acclimatized more speedily than would fowls subjected to the same change. I know of no instances that might be cited in support of this view, and am rather inclined to think the contrary true, though some of my experiences seem to indicate that when chicks are raised to maturity from travelled eggs, they become more completely acclimatized than they would if brought when at or near maturity. There can be no doubt that the chicks from travelled eggs must, after hatching, undergo precisely the same process of acclimatization as adult fowls.

When we consider that the first few weeks of a chick's life are critical under the most favourable conditions, it is not at all surprising that there are so many complaints of poor chicks from travelled eggs. With this point in view, we see how unfair is any comparison between a man's home-bred stock and that which he has raised from purchased eggs, or hatched from imperfectly acclimatized stock.

“The recognition of the influence of change of climate furnishes an explanation of many of the disappointments in the quality of stock, even those bought from reputable breeders. It is well known that the tendency to reversion is strong in all thorough-bred stock; but it is not so well known, though just as well ascertained, that a change of location strengthens this tendency. The reversion may be a general deterioration, or may be confined to a few particulars, possibly to only one. It may take the form of deterioration of plumage, or departure from typical shape, or impairment of vigour, or decrease in fertility. It may be general, affecting all the individuals subjected to the change, or special, affecting only a part of them. It may be accomplished so rapidly that it will be difficult to believe that fowls could change so much in so short a time; or so gradually as to escape notice for several generations. It may be permanent and irreparable, or temporary and be gradually eradicated as the stock becomes acclimatized. But that reversion does take place under changed conditions, has been shown so often in the case of other domestic animals that the breeder of fowls who finds his newly

bought stock disappointing will do well to consider this point fully before condemning the strain, and accusing the seller of fraud.

“The aptitude for acclimatization depends on each individual fowl; the results of changes depend on conditions beyond our control. Whether any, or a part, or all of a flock may become acclimatized depends on how many of the flock possess the power of adapting themselves to the change. The only way in which it can be found what birds possess a tendency to constitutional variation is by actual test—by submitting them to the change.

“Every buyer of fowls and eggs should keep these facts well before him when making a purchase, and make up his mind that the transaction, like marriage, is ‘for better or for worse.’ They may not be perceptibly affected by the change; it may benefit them; it may injure them. The results depend in part on matters beyond human control, and almost outside the realm of human knowledge.

“The time required for acclimatization varies in different individuals, and with the degree of variation necessary to an approximate acclimatization. Where a change is immediately beneficial, or does not appreciably affect the fowls either way, the element of time hardly needs consideration; but close observation will show, I think, that even after slight changes the first results in breeding are less satisfactory than those obtained later, and that it is always best to have fowls in their new home some little time before the breeding season. A few breeders see the importance of this point so clearly that

they make a practice of mating their home-bred fowls, as well as others, some months previous to the breeding season.

“ It will be found, however, that in a majority of cases changes are to some extent detrimental, and even where no permanent deterioration results, a period varying from a few months to a year or more must elapse before fowls are, to all intents and purposes, the same as before the change. Some contend that a perfect acclimatization never does take place in the individuals first subjected to the change ; that it can only be accomplished in their descendants, but practically we may say that fowls are acclimatized when their average fecundity reaches the point it did in the old habitat, and the offspring are not noticeably different from the average of their race. As a general rule, I think, it is not safe to breed from fowls which have been subjected to a radical change of climate until they have been in their new home twelve months.

“ At one time I was of the opinion that the period required for acclimatization might be longer or shorter, according to the season at which the removal took place. Such experiments as I have been able to make, fail to confirm this opinion. There are some changes which commonsense alone teaches us ought not to be made—as, for instance, the removal of fowls from a cool to a hot climate during the hottest season, or *vice versé* ; or the removal of fowls immediately previous to, or during, the moult. Aside from such changes as these the season of the year seems to have little to do with either the nature of the process or the time required for its consummation.

“It is reasonable to suppose that in removing fowls to a climate widely different from that to which they are habituated, it would be an advantage to accustom them to the change gradually. Yet, when we consider that we cannot estimate in advance the effects of a given change, we see how difficult it would be to regulate a gradation of changes intelligently.

“Just *how* climatic changes affect an animal, physiologists cannot tell us. The most pronounced effect is on the blood ; but they are still at a loss whether to say there is a reduction of formation of blood, or a too active destruction of blood. Perhaps both causes operate at the same time. The diseases commonly resulting from the change from a temperate to a tropical climate are anæmia, malaria fever, dysentery and liver complaint. Following the change from a hot to a cold climate, we find an increased liability to affections of the throat and lungs. Diseases of both kinds may be noticed as common in fowls which have been moved from one locality to another. It should be borne in mind that there are few localities where climatic conditions do not vary considerably. *Local changes in the weather* have the same relations to certain diseases as have changes in localities ; but in the case of removals the diseases occur in more aggravated forms than when they follow ordinary variations of temperature and humidity. Thus, a sudden fall in temperature may prove fatal to an unacclimatized fowl by producing a malignant form of croup, bronchitis, or pneumonia, while the acclimatized fowl exposed to the same conditions escapes with a mild attack

of 'sniffles.' In like manner the new arrival is seriously affected by extremes of heat and dampness which affect fowls reared in the locality only by causing them discomfort.

"It is not likely that there is any breed of domestic fowl incapable of becoming acclimatized in any locality where men can live, except possibly in polar regions. Some breeds may be more susceptible to change than others, and some may attain development only in certain districts ; but in every breed enough individuals will be found able to propagate their race, with, perhaps, some modifications of form or colour, or with a diminution of size or prolificacy, in their new home. This is the phase of the question which concerns poultry-breeders most, and to which they should give most careful consideration. We need to study the subject in all its ramifications. While, as has been said, in the present state of knowledge of the influence of climate, results of changes cannot be anticipated and we leave much to chance, it may be that a better understanding of the subject will enable us to act with some degree of intelligence, at least to the extent of modifying the effects of changes. In any case it will be well to have what can be known on the subject a matter of common knowledge. Every intending purchaser of stock or eggs should know that results may be disappointing through no fraud on the part of the breeder, and through no inherent defect or weakness in the stock that is not common to all fowls. If we cannot learn to overcome the effects of climatic changes, we must learn to allow for

‘shrinkage’ due to such changes, and to make the allowance without grumbling.”

A number of people in India have imported fowls from Australia and their experience goes to prove that Australian birds do better in India than do the birds imported from England. The journey from Australia to India could be considerably shortened if arrangements were made for the birds to be sent *via* Colombo. If shipped to Colombo and from there by either train or steamer to the Indian port, the voyage would take only from 15 to 20 days instead of from 32 to 40 days as is usual, and the shorter journey will not be so harmful to the poultry.

CHAPTER XIII.

DISEASES OF POULTRY.

It is comparatively easy to prevent fowls from becoming ill, but once sickness gets in among them, it will be found extremely difficult, if not impossible, to effect a cure.

“Prevention is better than cure” is a motto especially applicable to fowls and their diseases. In most cases, the only thing to be done when serious disease takes hold of a fowl is to kill it and bury it deep under ground or burn to ashes and bury the ashes.

The most common causes of illness among poultry are dirt, damp, overcrowding, bad food and water, badly ventilated or draughty house, vermin, and, very frequently, contagion. I have seen poultry-houses reeking with the odour of manure, and infested with vermin. Lack of cleanliness is a prolific cause of disease. Fowls are certain to become ill if they are kept in a badly ventilated house or are overcrowded. Neither can they stand wet—they are unlike ducks. Water will soak right through their feathers and give them a chill.

When fowls have been purchased at an auction, market or from dealers, or have been bought from a person the condition of whose poultry-yard you know nothing about, or when the birds have travelled, it is always safe to keep

them separate from the other birds for at least a month. Birds that have travelled long distances in very close coops and hot railway waggons, or are exposed to draughts and wet on the journey, are liable to become over-heated or chilled and take ill. They must be kept separate for at least a month and be fed and watered separately, and the vessels used for them never used for the other birds. Frequently a bird brought into the poultry-yard will bring infection with it, and cause terrible havoc among the birds. Too great precaution cannot be taken in this matter. When a bird is brought into the yard, it should be closely examined ; examine its mouth and throat for canker and diphtheria, and the nostrils and head for roup, the legs for scurvy, and under the feathers for lice.

The first thing to do when a fowl becomes ill is to remove it from the rest, and place it in a small, dry, warm and properly ventilated house by itself. This will give the sick bird a chance to get better, and prevent the disease spreading through the yard. Sick poultry must be kept warm, fed properly and treated gently. The next thing to do is to find out and remove the cause or causes of the disease and give some preventive to the unaffected birds, and thus prevent all the other fowls from becoming sick. The poultry-house and the place where the sick fowl is kept must be frequently disinfected with Carbolic powder, or Phenyle powder. You can make Phenyle powder by mixing eight ounces of pure Phenyle with three or four seers of clean sand or sifted ashes.

I shall divide the diseases of poultry into three classes : first, common and simple ailments ; second, serious but not infectious diseases ; and, third, infectious diseases. Most of the medicines prescribed are homœopathic, and can be obtained from any homœopathic dispensary. They are safe and efficacious.

1.—COMMON AND SIMPLE AILMENTS.

1. *Fledging*.—Chickens often droop and suffer much whilst their feathers are growing, especially in the cold and wet weather ; and the breeds which feather most rapidly suffer most ; getting the feathers too early and rapidly weakens them and stunts their growth.

Keep them out of the wet and damp, and give them sufficient warmth. Clip the feathers of the wings and tail. Give some meat every other day, and a little chopped onions and garlic. Put a few drops of Parrish's Chemical Food in their drinking-water, or give a little Douglas' Mixture ; put a little Poultry Powder in the morning food ; give it only two or three times a week. Dust frequently with Rough on Lice.

2. *Moulting*.—Some fowls suffer very much during moulting. If care be not taken, they will be permanently injured if not die.

If kept separate and properly fed and housed, fowls very seldom suffer much during this period. Very fat birds suffer much during this period. Birds in moult should not be allowed to remain in the breeding pen, or cocks and hens to run together.

Protect the bird from damp, cold winds, and from intense heat.

If the bird is becoming thin and looks unwell, give oat-meal or wheat-meal mixed with milk in the morning, and a little meat during the day. A small quantity of linseed meal given in the food twice a week will be beneficial. Give some Sulphur or the Poultry Powder and Douglas' Mixture twice a week. It will greatly help the older birds if the old feathers in the wings and tail and in the legs are gently pulled out. The birds should be kept free from lice and given plenty of green food, and, if possible, allowed free range or a large run.

3. *Loss of Feathers*.—Vermin and want of green food are the chief causes of fowls losing their feathers before moulting.

Rub the fowls with Rough on Lice ; give a liberal supply of green food ; provide a dust-bath ; and remove the bird from among the other fowls, and keep it warm, well sheltered from damp and cold winds. Give Sulphur or the Poultry Powder in the food.

4. *Soft Eggs*.—Some hens lay soft-shelled eggs, that is, eggs with a skin only. This is caused by want of sufficient lime or by overfeeding. It is also sometimes caused from the bird being driven about and frightened, or from the bird being troubled with vermin.

Remove the causes. Supply lime ; reduce food ; keep free from vermin ; and treat the bird gently.

5. *Scaly Legs*.—Sometimes fowls are greatly troubled with this. It is caused by an insect under the scales of the legs. It is infectious.

Bathe the legs every morning for three days with kerosene oil or a strong solution of Phenyle and water, or else wash with soap and warm water and rub on some Zam Buk or Embrocation. The Poultry Powder or Sulphur will do good.

6. *Soft Crop*.—The crop is enlarged and soft as if filled with water; when pressed, most offensive water is discharged. This is caused by obstruction of the food passage or by indigestion. If any obstruction, remove the cause; if by indigestion, give a small teaspoonful of Epsom Salts, after this give Condyl's Fluid, five drops three times a day in a dram of water, and some Tonic Mixture once a day for a week, supply grit. Add charcoal to the food, or give it in pills. Stop soft food for a time and feed only on whole wheat.

7. *Feather-eating*.—Some fowls are greatly addicted to eating feathers. If they do not find them lying about, they will pull them off the other fowls. Rub some Asafoetida, kerosene oil or Elliman's Embrocation on the feather of the neck or part of the body from which the feathers are plucked.

It is caused from want of sufficient iron and animal food. Give a little Sulphur and Salt or Poultry Powder in the food, and Douglas' Mixture in the water.

If the hard horny parts of the beak are pared with a sharp knife, the bird will find it difficult to pull feathers. Feather-eating is sometimes a vice, and nothing will cure the bird of it. The best thing in such a case is to kill the bird.

8. *Egg-eating*.—Some fowls eat eggs, and will devour all they can find in the laying-house or sitting-nests.

Want of lime and gravel or worms and insects in the fields are the chief causes. Supply these and give the bird her liberty. If this will not cure her, a number of eggs should be emptied of their contents and filled with a paste made of the eggs mixed with strong mustard and Phenyle. The hot mustard and Phenyle will teach the bird a lesson, and she will leave the eggs alone. If this will not cure her, she must be killed. Cocks as well as hens are given to eating eggs; and if one fowl does it, others will learn to do it also.

9. *Pale Yolks*.—The eggs of some breeds are naturally of a pale colour; but sometimes eggs have an unnatural paleness, which is a proof of weakness. Birds kept in confined runs and insufficiently supplied with green food produce pale yolks.

Give the hen a large run and abundance of green food; also some of the Poultry Powder or Tonic Mixture.

2.—SERIOUS BUT NOT INFECTIOUS DISEASES.

1. *Apoplexy*.—This disease is generally caused by over-feeding, exposure to the heat and close confinement. Langshans, Brahmas and Rocks are very subject to apoplexy. They seem to suffer more than the other breeds from the effects of the heat. The attack is sudden and generally fatal. During the hot weather, and in the rains, hens in their nests in the act of laying are frequently attacked. Sometimes excitement will bring it on. Sometimes cocks and hens will get to fighting, and this will cause apoplexy. If the bird be not dead when noticed, it should be immediately bled by

cutting the vein nearest the bone under one of its wings, and cold water should be poured from a little height upon its head. If the fowl recovers partially, give it Belladonna 1x, one drop in a teaspoonful of water three times a day for two or three days, and feed her sparingly on soft food for a week.

Sometimes signs of an approaching attack can be observed—the bird having a staggering, unsteady gait, as if intoxicated. In such a case it must at once have its head bathed in cold water, and be removed to a cool, quiet place. Give it a teaspoonful of Epsom Salts, and after that two drops of Belladonna four times a day. During the hot weather put a tablespoonful of Epsom Salts to a quart of the drinking-water.

2. *Bumble Foot*.—Large fowls are especially subject to this ailment. It consists, as its name implies, of a gathering at the bottom of the foot. Paint the part affected with lunar caustic, or, if the foot is very bad, apply linseed poultices to it daily until the gathering is ripe, then lance it with a sharp knife, and take out all the matter. Sometimes a hard core will be found in it. The patient should not be allowed to roost on the perch at night, but should be bedded on straw till the foot is quite healed. The wound should be properly washed with Phenyle and water, and the poultice should be continued for a few days after the lancing; a little Vaseline and Iodoform, Zam Buk or Elliman's Embrocation applied to the spot and the foot bound up with a bandage will soon cure it. The bird should be kept in confinement until the wound has healed.

3. *Cramps*.—Cramps are brought on by exposure to wet or keeping the bird in a damp or cold place.

Boil *neem* leaves in water, add some salt, and rub the legs with it. Elliman's Embrocation is very good. Give warm and nourishing food, and keep the bird in a dry, warm and sunny room on straw. Give internally Rhus Tox. 1x and Bry. Alb. 1x alternately, one drop twice a day, or else give the Tonic Mixture. Do not give rice, but feed on barley, wheat and oats.

4. *Crop-bound*.—It is no uncommon thing for the crops of fowls to become so full of food or of some other substance that they cannot assimilate it. The consequence is that the fowl is unable to swallow anything, and naturally it pines away. The causes of crop-binding are various. It may be caused by the bird swallowing a piece of leather, paper, bone or matted grass. It manages to get this as far as its crop, but there the thing sticks, and refuses to go any further, blocking up the passage to the stomach, and finally preventing the bird from swallowing anything else.

Again, a fowl will at times gorge itself with a quantity of dry food, until its crop becomes unduly distended. Then the bird goes and has a drink; this causes the food to swell, the crop becomes yet more distended and loses its power of elasticity. In order to cure the bird, its crop must be emptied. To do this, first pour a little warm water down its throat, and gently knead the crop with the hand for a few minutes. Leave the bird for about an hour, and then repeat the operation. this time pouring a little olive oil

down its throat. If this does not do any good, take the bird between the knees, with its head downwards, and try to force the food in the crop out into the mouth by gently pressing the crop downwards.

If all these measures fail to have any effect after they have been repeatedly tried, it will be necessary, as a last resort, to cut the crop open and empty it. This should only be done in extreme cases, when everything else has failed.

There should be two persons to perform the operation, the operator and his assistant. Let the assistant take the bird in his lap, and keep it quite still by holding the base of the two wings with one hand, and the legs with the other. The operator will require a very sharp knife, a small article such as a small scoop or a small mustard spoon with which to empty the crop, needle and some thread for sewing it up. All the instruments, and also the hands of the operator, must be dipped in diluted Jeyes' Perfect Purifier, Izal or Carbolic lotion. First make a straight cut in the upper part of the crop, about an inch in length, and then make a cut in the inner part and take out all the contents of the crop through it. Wash the crop with Condyl's Fluid and warm water, and sew it up again. The thread used for the sewing should be either horse-hair or catgut, not any vegetable substance, and the two skins must be sewn separately. Apply Zam Buk or Elliman's Embrocation to the wound. After the operation the bird should be fed very sparingly on soft food only, and for the first day it should not have any water. It must not

be allowed to have any whole grain for at least a week afterwards. Give some Poultry Powder or Tonic Mixture.

5. *Egg-bound*.—Hens are sometimes unable to pass their eggs. This is caused by the eggs being too large, the hen being too fat, or inflammation of the egg-producing organs. If not relieved, the bird will die.

The bird will go more than once to the nest, sit there some time, and then rush about to find another place. She will become mopish, and then unable to move. She will die in a day or two, or may linger on for a few days.

Apply some vaseline up the vent by means of a syringe or feather, and hold the bird over a pot of hot water and let the steam envelope her vent. Give a teaspoonful of Epsom Salts, and a drop of Aconite to the bird, and keep on low diet. Some persons can bring away the egg with the hand, but this operation needs very great care, as the bird may be permanently injured. Sometimes the egg will break inside and pass out.

6. *Inflammation of the Brains*.—This is an incurable disease, so is also vertigo. Destroy the bird.

7. *Leg weakness*.—This complaint is usually found among young cocks of the larger breeds, and is caused either by wrong feeding, too rapid growth, damp, excessive heat, too much confinement, cold, damp floor or breeding from immature or weakly parents.

Give plenty of animal food, and some Phosphate of Lime every day. Give Parrish's Chemical Food in small doses, or some Tonic Mixture, and rub with Elliman's Embrocation. Give as much exercise and liberty as possible.

8. *Paralysis*.—This is incurable ; it is best to destroy the bird.

9. *Rheumatism*.—This disease is very much like cramps, except that it is accompanied with swelling of the joint and great tenderness. The same treatment as cramps.

10. *Vermin*.—This cannot be called a disease, but frequently leads to it by causing disquietude and want of rest. In India, fowls are greatly troubled with these pests, much more so than in England, especially during the rains. Lice, bugs, ticks and fleas may be included in this category. It causes hens to break their eggs, and leave their nests, and fowls to desert their roosts at night, during which time they cannot rest. Prevention is better than any cure in this case by keeping the poultry-house and the run clean. Apply some kerosene oil and tar to the inside of the house, coops, nests and perches ; lime-wash the outside of the house, but put some Phenyle in the lime, or wipe with a mixture of kerosene oil and tar thoroughly. Sprinkle Carbolic Powder or Phenyle Powder on the fowl-house floor, or wipe the floor with kerosene oil.

Lice are a terrible but unavoidable plague, which you must fight against constantly. Chickens just hatched from under the hen are sometimes covered with lice on the head and neck ; sprinkle the little creatures with Keating's insect powder, then wait for an hour or two, and rub Keating's insect powder on the affected parts very gently, and after a little while the disgusting parasites will try to make their escape by coming to the surface of the soft fluff of

the chick instead of sticking on the skin and tormenting the poor little bird. The lice seem half intoxicated from the effects of the powder and are then easily removed ; still they do not die and ought to be burnt or dropped into a strong solution of Phenyle or kerosene oil and tar. This should be repeated once a week. Rough on Lice is more effectual, but it also affects the chickens, which droop for a while, and though I have never seen any die of the effects of the powder or be any the worse for it after a little time, still I should say Keating's powder was much the safest to use for little chickens. The mother hen must also be properly rubbed over with Rough on Lice. After rubbing her, keep her separate from the chickens for an hour so as to allow her to shake off the lice and powder that are on her.

After about a week the process of rubbing heads and necks of chickens must be repeated. When half-fledged, the birds seem to have a period of rest from their enemy, but still they must be looked to, and if any traces of lice are found, apply some Rough on Lice. There are four different kinds of lice and fleas that trouble fowls. The house bug also is very injurious to fowls. They live in the coops, perches, nests, walls and floors. The only way to get rid of bugs is to close up all the doors and air passages of the fowl-house and burn plenty of sulphur in it and keep the fumes in the house for six hours. After that, the house, floors, doors, boxes, nests and everything in the house must be thoroughly washed with strong Phenyle and water and then painted with a solution of kerosene oil and tar. This must

be repeated frequently. Unless the birds and the house and coops are thoroughly freed from vermin, the birds will die. As mentioned before, chickens from the incubator have the great advantage of keeping free of lice, at any rate till they have had time to grow strong. Many young broods droop and die off, simply on account of lice and bugs, nobody suspecting the pretty little chicks to be so tormented and gradually killed by those small but formidable enemies.

For grown-up fowls, I use cocoanut oil six parts, oil of Eucalyptus one part and kerosene two parts as a cure for lice, but it ought not to be necessary to use this remedy, except during the rains and, perhaps, when moving a hen from her nest. It must never be used for sitting hens, as the powerful kerosene kills the chicks in the eggs. Great care must be taken to see that the oils are thoroughly mixed before applying, otherwise the kerosene oil will greatly injure the birds.

Another very good remedy for lice on fowls is oil of Eucalyptus one ounce, spirits of Camphor one ounce, properly mixed with six ounces of cocoanut oil, and applied to every part of the bird where lice remain. Instead of the above the following may be used with good results :—

Spirits of turpentine	..	..	three chittacks.
Camphor	..	..	one chittack.
Cocoanut oil	..	..	twelve chittacks.

Apply only a few drops to each part. At the same time the coops, nests and all the wood and bamboo work must be thoroughly rubbed with kerosene oil seven parts and coal-tar

one part, well mixed together. This should be done once a week.

Ticks are very troublesome in some parts of the country, and are more difficult to get rid of than lice. The ticks get under the feathers of the poor birds, and burrow under the skin and soon kill the birds. On close examination you will find the corners and crevices of the coops and houses crowded with the vermin. It is a case of kill or cure. Pick off all the ticks you can find on the birds and rub the birds with Cocoanut oil 12 parts, Turpentine one part, Camphor one part, Phenyle one part and Eucalyptus oil one part. Treat the house, coops, etc., in the same way as for bugs.

11. *White Comb*.—White comb and black rot of the comb are both troublesome diseases, and frequently the affected birds die. The disease is caused from bad feeding and want of cleanliness. Give from half to one teaspoonful of Epsom Salts in a little warm water. Wash the affected parts with Phenyle and water.

Make an ointment of the following :—

Camphor	..	..	..	one part.
Phenyle	..	..	..	one part.
Turpentine	..	..	..	two parts.
Cocoanut oil	..	..	..	four parts.
Sulphur	..	..	..	four parts.
Boracic Acid Powder	..	..	..	four parts.

Rub the affected parts with the ointment.

I have used Zam Buk with very good results.

Give plenty of green food, and feed on soft food for a time.

Give Arsenicum Alb. 1x, one drop doses three times a day internally. Or give the Tonic Mixture.

12. *Wounds*.—Wounds ought never to be neglected. Dress with a solution of Permanganate of Potash or Phenyle and water. Apply some ground turmeric, or equal parts of ground sulphur and Boracic Acid Powder mixed together.

A broken leg can be set if taken in hand at once, and a plaster-of-paris jacket made over the leg with powdered plaster and water, the fowl being held fast till the plaster becomes hard. If this cannot be done, the broken limb must be put up in splints. The bird must be kept confined in a quiet corner for a few days.

13. *Seep*.—This is really consumption, and is incurable. The fowl eats, but is listless and grows thin. There may not be any sign of cold. Try cod-liver oil. The best thing to do is to kill and bury the bird.

14. *Swelling of the oil gland* above the tail. Do not press or cut it. Take a stick of turmeric, hold the end over a fire. Press the burnt part over the swelling; do this three or four times, after that apply some ground turmeric. If matter has formed, then it is necessary to cut the gland and remove the pus and wash it with Phenyle and water and apply ground turmeric or Boracic and sulphur.

3.—CONTAGIOUS DISEASES.

1. *Chicken-pox*.—This is really small-pox in fowls. Chicken-pox is often mistaken for roup. There may be a slight cold in the bird at the beginning, and the bird may

appear to be dull and refuse its food ; but, generally, the disease shows no premonitory symptoms. Sometimes the bird has chicken-pox and roup at the same time.

It is caused generally by contagion, and is very infectious. I have known it sometimes to break out when no other cause but want of cleanliness and bad food and water could be attributed. The disease is communicable from the fowl to human beings and from human beings to fowls.

Symptoms.—A pustular eruption appears on the face, under the wings, and, in some cases, on the feet of the bird. The vesicles are pointed in the centre, and about the second or third day is filled with a watery fluid. Frequently the vesicles enlarge and run into one another. The eyes and mouth become affected ; the bird becomes blind and is unable to eat ; the feet become so bad that the bird is unable to walk. For the first day or two the bird shows very little signs of constitutional disturbance ; but the fever and inflammation gradually increase until the bird becomes very weak and is unable to move. It dies in a few days.

In mild cases the pustules dry up and fall off in three or four days, and the fowl is soon quite well again. If properly treated, the bird will recover even though the disease be of a severe form.

Treatment.—This disease must never be neglected. The secret of success is to commence treatment immediately the first signs of the disease appear.

Separate the sick bird from the other poultry, keep it in a dry, cool and properly ventilated room free from

draughts and a good distance from the other poultry. Give each bird from $\frac{1}{4}$ to 1 teaspoonful of Epsom Salts, to which add one drop of Tincture of Aconite. Feed on soft food, such as boiled rice, bread-crumbs and milk, barley-meal, ground wheat and milk; give it as much water as it will drink, but put a teaspoonful of cream of tartar in a pint of water and place this in a clean earthen vessel near the fowl, so that she may drink at pleasure. Wipe the face and the legs with a cloth dipped in a strong lotion of Condyl's Fluid or Permanganate of Potash and water, and apply some ground turmeric and *neem* leaves to the affected parts. Another good remedy for external application is the juice of the leaf of the Bhangrya plant. This plant is known to a great many natives. Some people have rubbed the affected parts with the juice of unripe tomatoes with good results.

Give internally the following native medicine which I have found to be very efficacious :—

Root of the *Chircheri* or *Chorchora* plant, four tolahs.

Root and leaves of the *Jokha* or *Joga Baila* plant, four tolahs.

Thorn of the *Shimul* cotton tree, four tolahs.

The whole to be thoroughly ground and mixed together. Give of this five grains to each fowl three times a day. Or give five drops of Spirits of Camphor once a day.

Homœopathic Treatment.—Give *Rhus Tox.* lx, *Pulsatilla* lx, and *Aconite* lx, alternately, one drop in half a teaspoonful of water every two hours until recovery.

By the use of these medicines I have cured 95 per cent. of fowls afflicted with small-pox.

The unaffected birds should be given these medicines also as a preventative.

2. *Cholera*.—Poultry-yards to-day are plagued with more than one disease that was altogether unknown to our grandfathers, and the most dreaded of these is undoubtedly chicken cholera. It makes its appearance in a yard often, no one knows how, and in a few weeks destroys the greater number of the birds. Preventive measures often seem absolutely useless, and in spite of everything that he can do, the owner sees his best birds carried off, one after another. This disease was for some time known to us only by the reports of the damage it was doing in the yards of breeders in America and on the Continent, but every year it seems to be becoming more and more common among us.

The usual causes of cholera are lack of stamina in the birds, overcrowding, uncleanness, lack of green food and absence of shelter from the rays of the hot sun. Drinking stale, tepid water and eating decayed vegetable matter are also frequently to blame for its origin. There can be no doubt but that it is highly contagious, and one sick bird will pass the disease on to a whole yard.

When a bird is first attacked, it loses its appetite, looks thoroughly out of condition, its feathers are ruffled, and its eyes sunken and lacking lustre. What food it does take it seems unable to assimilate, but it eagerly consumes a large amount of water. It has diarrhœa, and at first the excrement

is green and slimy, but afterwards it becomes whitish and frothy, and sometimes specks of blood are found in it. The bird becomes more and more sleepy and disinclined for exertion, and at last it sinks down and dies. Occasionally convulsions immediately precede death.

Practically there is no cure for this disease, for it runs its course so rapidly, and affects the intestines so much, that before any measures can have time to take effect the bird is dead. The fowl usually dies within twelve hours after the symptoms appear, though sometimes it lingers for several days. *Post-mortem* examinations show the liver to be swollen, congested with dark blood, and in such a state as not to bear handling; the spleen also is swollen, the intestines inflamed, and various other parts of the body affected.

If fowls are kept on fresh ground, are not overcrowded and are properly cared for, there is not much fear of their being attacked. Should a bird become ill, strict repressive measures must at once be taken. Every fowl in the slightest degree affected must immediately be destroyed and burned or put right away from the others. The water which the healthy birds drink should have a small piece of camphor placed in it. All the excrement must be gathered up, and the house and run have quicklime, or some Phenyle scattered over them. The inside of the house should be cleaned with special care, and the walls and various appliances washed with fresh quicklime and water, in which is mixed Carbolic or Sulphuric acid or some Phenyle.

Whatever is done towards attempting to cure the sick bird must be done on the first appearance of the disease, for in a few hours it makes such progress as to render successful treatment impossible.

When the disease first appears, give the bird *Veratrum Album* 1x and *Arsenicum Iod.* 3x or *Aconite Nap.* 1x alternately every half hour or fifteen minutes; give one drop in a teaspoonful of water for a dose.

If the above remedies are not at hand, then give a teaspoonful of pure olive oil and five drops of Tincture of Camphor every two hours. Or else 5 drops of Perry Davis's Pain Killer in a teaspoonful of water four times a day.

Feed the bird on arrowroot balls mixed with cold water. Only half a teaspoonful at a time must be given every three hours.

Great care must be taken not to spread the complaint by going immediately from the sick fowl to the healthy stock, or by carrying anything from the one to the other. When the bird dies, its body should be buried deep under ground, or burned.

Unless the bird is a very valuable one, the best thing to do is to kill it, and bury or burn it immediately it is attacked with the disease. It must always be borne in mind that this disease is communicable from the fowl to human beings. A strong solution of Phenyle and water should be used in the house and coop. Put Douglas' Mixture in the drinking-water of all the fowls.

Give all the unaffected fowls 3 drops of Perry Davis's Pain Killer in a teaspoonful of water or else 5 drops of Tincture of Camphor in a teaspoonful of olive oil once a day for three days.

3. *Cold*.—This complaint is indicated by the same symptoms as we find in human beings, namely, a running at the nostrils, and a slight swelling of the eyes. It arises from cold or exposure, and, if not attended to, may develop into roup or consumption. A person suffering from cold and cough or influenza must not be allowed to go into the fowls' run or house. Fowls take the infection from human beings. For cure, the bird should be kept in a warm place, and have one drop of homœopathic tincture of Aconite 1x and Arsenicum Alb. 1x, alternately four times a day—add ten drops of glycerine; or else give one grain Quinine and three drops of Sulp. acid dil. twice a day. Give nutritious food, rather stimulating in its nature. The natives give a tablespoonful of pure mustard oil and a quarter teaspoonful of ground chillies. Inject a little Condyl's Fluid through the nostrils. Put a little glycerine and camphor in the drinking-water of the fowls that are not affected.

4. *Diarrhœa*.—Diarrhœa is caused by bad feeding and dirty water, want of cleanliness, exposure to wet or excessive heat, indigestion. If not attended to, diarrhœa will turn to cholera.

Give the birds a tablespoonful of olive oil or a teaspoonful of Epsom Salts, and give Ipecac. 1x. two drops in a teaspoonful of water every two hours, and then give Ars. Alb. 1x one

drop in a little water every two hours or a dose of Tonic Mixture twice a day ; keep the bird in a quiet corner, and feed on arrowroot mixed into balls with cold water. Three drops of Perry Davis's Pain Killer in a dessertspoonful of water three times a day will do good.

5. *Dysentery*.—This is brought on from the same causes as diarrhoea.

Give a tablespoonful of olive oil or a teaspoonful of Epsom Salts, and also Ipecac. 1x two drops in a little water every two hours for a day ; and then give Mercurious Cor. 3x one drop in a little water every two hours. Feed on arrowroot, also give a little *bael* fruit. Keep the fowl quiet and away from the others.

6. *Liver Disease*.—When any valuable fowl is seen to be pale about the face and shrunk about the comb, it should be handled at once to see if there is corresponding wasting away, for this generally denotes tubercular disease of the liver, a complaint that will not only inevitably prove fatal, but is also highly contagious. Occasionally a bird may be found to be going light without the symptoms of liver complaint, and this may be due to pulmonary disease, though there would be a cough to indicate complaint of the lungs. There is no cure for this. Ordinary cases of birds going light after a hard season of laying may be cured with cod-liver oil.

7. *Gapes*.—This disease is chiefly confined to chickens, and is due to the presence of small worms in the throat. These obstruct the air passage, so that the bird has

continually to open its mouth and gape in the effort to breathe, hence the name of the disease.

There are numerous methods of treating gapes. One common way is to take a feather, strip all the down off it except a little at the point, dip this point in turpentine and camphor, place it down the throat of the chicken, and after giving it a twist or two round, pull it out. The worms are often thus extracted from the throat with the feather. This plan, however, requires care, or else the chicken may be choked. In very mild cases it may be sufficient to place a little Camphor or a small quantity of Turpentine or Phenyle or Condyl's Fluid or Permanganate of Potash in the drinking water. Another, and a very effective cure, is to cause the chickens to inhale the fumes of Carbolic acid. When the acid is heated it gives off a quantity of fumes. Hold the head of the bird among the fumes so that it inhales them, taking care at the same time that they are not sufficiently dense to suffocate it. This will very likely require repeating two or three times in order to thoroughly destroy the gape-worms. Or else mix one drop of Turpentine, one drop of Eucalyptus oil and one drop of Tincture of Camphor with six drops of mustard oil and pour gently down the chicken's throat. I have sometimes put a couple of drops of Spirits of Camphor on a small piece of bread and put it down the bird's throat. Repeat this twice a day for three days. Try three or five drops of Little's Soluble Phenyle in a teaspoonful of water, and gently pour it down the bird's throat. It is well to dust the chicken-house and run with fresh

lime or strong Phenyle Powder after a case of gapes has appeared there.

The disease is epidemic, and is generally caused by foul water, exposure to wet or by decayed food. The sick birds must be separated from the others.

8. *Scurfy Face and Comb*.—This disease is caused by fungoid growth of insects, and is contagious. Apply the following lotion :—

Eucalyptus Oil	..	..	One part.
Spirits of Camphor	..	..	One „
Phenyle	..	..	One „
Turpentine	..	..	Two parts.
Cocoanut Oil	..	..	Four „
Flower of Sulphur	..	..	Four „
Boracic Powder	..	..	Four „

Wash the parts with Phenyle or Izal and water and apply the lotion twice a day. Zam Buk also is very good. Natives apply ground raw turmeric and *neem* leaves with good results.

Give the bird Ars. Alb. 1x twice a day, one drop in a little water, and feed on simple nourishing food. Give Poultry Powder or Tonic Mixture.

9. *Roup*.—Roup is the disease most to be dreaded for poultry. It is highly contagious, and at the very first symptom the affected fowl ought to be separated from the rest, put in a warm place and fed on meal mixed with hot milk. Roup begins with a common cold, a clear discharge comes from the nostrils, and the eyes look watery; this

discharge soon becomes frothy, often very offensive, the nostrils become partially or entirely closed, hence a difficulty in breathing; in some cases the eyes, and often the whole face, swell very much. Roup is, as distinguished from other diseases about the head, an epidemic disorder, having its starting point in the soft lining membrane of the beak. From this it may extend in all directions—to the external skin, or down the throat, or into the eyes, perhaps through the tear-duct. The constitution is severely affected by it; and although it is frequently not more severe than a common cold, it may, and very frequently does, cause death.

Symptoms of Roup.—It may come on suddenly, or slowly, with previous signs of general debility, moping, etc. The first signs are those of catarrh or cold in the head; dry cough or dull wheezing. Much fever; the fowl drinks eagerly. The comb and wattles may be pale or dark coloured. The cold grows worse. There is a yellowish or bloody discharge, thin and watery at first, which grows thicker and thicker, and fills, in severe cases, throat, nostrils and eyes, the latter being closed and swollen even to the size of a walnut, and the sides of the face may swell up. Pustules form all about the head and in the gullet, and discharge a frothy matter. The crop is generally swollen, though not always. The blind fowl cannot see to eat or drink, and hence is said to lose her appetite, although a most ravenous appetite is sometimes displayed. The discharge has a bad odour, and this is one of the chief signs of the presence of the disorder. Death may ensue from several causes; from starvation, the fowl no

being able to eat ; from suffocation, the thick matter clogging up the air passage ; or from simple debility, as in so many other disorders.

The matter may pass through the bowels, and thus simulate diarrhœa ; but this happens only in severe cases, and should not mislead the observer. A symptom, of which there is no satisfactory explanation, is loss of some of the joints of the toes, after inflammation, resembling dry gangrene in the human subject.

The list of symptoms will explain the various names which have been applied to it, *viz.*, swelled eyes, diphtheria, sore head, bronchitis, asthma, canker, influenza, sore throat, etc., but some of these conditions may exist even when roup is not present. One of the best means of detecting the approach of roup is to lift the wing of the suspected bird and see if there is not a spot where the feathers are smeared with a discharge from the beak, which has rubbed off when the bird has put its head under its wing at night. Also, invariably look at the nostrils, and see if they are clean and free from the slightest clogging. Go the rounds at night with a lantern and inspect your birds. Listen then for rattling or sneezing. After death, the gall bladder and liver are found full of matter ; the flesh is soft, easily broken down ; has a very disagreeable smell ; it is very shiny and spongy, specially near the lungs. The blood has been carefully examined, but presents no alterations of importance, except that there are, perhaps, fewer white corpuscles, a defect depending on the depression of the power of digestion.

Causes of Roup.—In all the above, there does not seem to be the trace of any special poison ; it is like a typhoid influenza, which, when it comes as an epidemic, will destroy a great many human lives. Cases not treated are generally fatal in three days ; some fowls may live seven to eight. Those causes that can be determined do not need enumeration here. Anything that lowers the tone of the fowl—bad ventilation, filthy houses, etc.—will most assuredly cause roup. A very prominent cause, however, is exposure to draughts and wet. So prominent is this, and so marked is the commencement of the disease at the beak, that it might almost be called malignant catarrh, and it is possibly nothing more. Fowls are sometimes destroyed by a cold alone. Roup is most common in autumn and winter, and where fowls are exposed to wet, cold draughts and damp sunless quarters. When fowls are shut up in a crowded, hot and badly ventilated place during the night and let out in the morning into the cold, windy and damp air, they are sure to become ill.

The disease is epidemic and contagious, from contact with the discharge, either when a diseased fowl touches another, or when a healthy fowl gets the discharge through the drinking fountain or otherwise. It can also, if brought into contact with the human eye, or with a wound, cause serious inflammation, so that caution is needed in handling the fowl. It has never been found, so far as we know, in any kind of wild fowl, though it may yet be discovered among them. It attacks all ages, preferably the older birds, and

may run rapidly or slowly. It also kills ducklings and turkey poults, though rarely.

Roup is often caused by fowls picking up the spittle of persons suffering from cold, influenza, consumption, diphtheria, etc. When fowls are kept very close to the habitation of man, or people are allowed to go very frequently among the birds and spit about in the houses and runs, the birds will become ill. Many people are very dirty in their habits of spitting and blowing their nose. I have very seldom found this disease among fowls kept in properly constructed pens and runs where people are not often allowed to go.

As soon as the disease is detected, the sick bird must be destroyed, and the other birds in the pen put under treatment. Unless the sick bird is a very valuable one, there is no use trying to doctor it; even if the bird does recover, it will be quite unfitted for the breeding pen. The time and effort spent in treating a sick bird should be applied to treating the birds that are not yet sick but have been exposed to the infection. The pen, run and boxes must be thoroughly washed with Phenyle and water, and when dried rubbed over with tar and kerosene oil. All earthen or wood water vessels and feeding dishes must be destroyed.

Treatment of Wet Roup.—If treatment be adopted, then, by all means put the diseased fowls by themselves and, so far as possible, each one in a separate place, and do not be in a hurry, even after improvement, to return them to the rest of the flock. If your situation allows of such a measure, break up all the healthy fowls into small colonies,

at a distance from each other. Take all possible pains to prevent any of the discharge from coming into contact with any other fowl. This necessarily involves thorough purification of the drinking vessels, and so forth. Some Jeyes' Fluid, Izāl, Phenyle or Carbolic acid is best for this purpose. The quarters should be carefully cleaned and disinfected.

The treatment is not always successful. I give the best, however.* It consists of measures to combat the inconvenience and dangers arising from the accumulation of the discharge, and the administration of medicine internally.

The secret of success is to begin treatment at the very commencement of the disease. The least delay may prove fatal.

For the cold and discharge from the nose and eyes, give internally Acon. 1x, Spongia 3x and Ars. Alb. 1x alternately, one drop every two hours. If the discharge be thick and yellow, give Mer. Cor. 3x and Aconite.

When there is ulceration of the throat, mouth or nostrils, give Belladonna 1x and Mer. Iod. 1x alternately, one or two drops or grains every two hours. Wash the mouth and face with a strong solution of Condyl's Fluid or Permanganate of Potash and water, and then paint the ulcerated parts with a strong solution of Nitrate of Silver. This should be done at least once a day.

When there is much fever and weakness, give Ars. Alb. 1x and Acon. 1x alternately, one drop every two hours.

Another remedy :—

Sulphate of Copper	..	..	$\frac{1}{8}$ grain.
Hydostrine	..	..	$\frac{1}{8}$ "
Balsam of Copaiba	..	..	2 grains.
Cayenne Pepper	..	..	2 "
Calcine of Magnesia	..	..	2 "
Liquorice Powder	..	..	2 "
Peepul fruit	..	..	2 "

Mix with mustard oil and make into four pills. One pill to be given in the morning and one at night.

Put ten drops of Condyl's Fluid or a grain* of Permanganate of Potash in half a teaspoonful of water and pour it gently down the bird's throat, or if the nostrils are bad, inject into the nostrils. Do this twice a day.

Press the pus out of the nose, and remove the cankers from the mouth and eyes. Wash the bird's face, eyes and throat with a strong lotion of Condyl's Fluid or Permanganate of Potash and rub Flower of Sulphur to the parts.

A teaspoonful of Epsom Salts twice a week will do good. If the bird refuses food, make up little balls of oatmeal or barley-meal and milk, and force them down the bird's throat. The balls must be made small, and only a small quantity given at a time.

The bird must be housed in a warm, dry and properly ventilated place, and kept on a bed of sand. Absolute cleanliness is necessary.

The disease is very contagious and is communicable to human beings. Unless the bird is taken in hand at the very

commencement of the disease, there is no hope of recovery. If the bird dies, burn or bury it.

Give the healthy stock five drops of Condyl's Fluid and one drop of Liquor Arsenic in half a teaspoonful of water every morning, before the morning-feed, or else give some Poultry Powder, or else rub some Eucalyptus oil on the face and nostrils and put some down the throat of each bird.

Recovery will be slow, but the treatment adopted must be persisted in. When the bird has recovered, it must be kept separated from the others for a month, and rubbed over with Rough on Lice before it is put back into the yard.

As a preventive measure the following should be adopted :—Put a pound of pure fresh coal-tar in a vessel with ten pounds of water, stir up well. Allow this to stand for a few days, and then draw off the water and put an ounce of it to every quart of water given to the fowls to drink, or else put some Permanganate of Potash—sufficient to make the water a deep pink in the drinking water every day.

10. CANKER.—This is a malignant disease and may be present with roup or may attack a bird that has not that disease. It affects the eyes, head and face, but more generally the mouth and throat. The disease becomes worse until it suffocates the bird. If the bird is not a very valuable one, it should be destroyed and burned or buried with quicklime.

If the bird is to be treated, it should at once be separated from the rest of the birds. The diseased growth must be removed by means of a scoop or forceps, and the affected parts thoroughly washed with a strong solution of Condyl's.

Fluid or Permanganate of Potash and water ; let this go right down into the throat and nostrils. After washing the parts dry with a piece of cloth, apply a little Flower of Sulphur and Boracic acid powder to the parts ; apply it dry and rub it well into the sores or else apply Nitrate of Silver. Give the bird half a teaspoonful of Epsom Salts, and feed on soft food. Add quarter of a teaspoonful of Poultry Powder to the food. Epsom Salts should be given once a week, but the Condyl's Fluid and Flower of Sulphur and Boracic acid or Nitrate of Silver must be applied twice a day. The coop and everything about the sick fowls must be thoroughly disinfected with Phenyle. Internally give Belladonna 1x, and Mer. Iod. 1x alternately, one drop in a teaspoonful of water every two hours.

THREE TROUBLESOME THINGS.

11. **EGG-EATING FOWLS : CAUSE AND CURE.**—Not a few poultry-keepers are annoyed by fowls eating their eggs and thus causing the keeping of poultry to be a source of loss instead of pleasure and profit. The chief of the causes of this habit is the accidental breaking of eggs in the hen-house and the fowls not having a sufficiency of shell-forming material. The latter is the most frequently predisposing cause of fowls becoming addicted to egg-eating. When an egg has been accidentally broken in the hen-house, it is very much less likely to be eaten if the fowls are being liberally supplied with shell-forming material. The eggs, too, are very much less liable to become broken when the fowls have an ample

supply of shell-forming material, because they would not be so likely to be thin-shelled. However, as a matter of fact, the laying of eggs with thin shells is mostly the result of an over-fat condition. When laying, hens have a strong instinctive craving for shell-forming matter, and then specially they will scramble for a broken shelled egg. Having once tasted an egg, they are very liable afterwards to peck at any which they may see and should they be thin in shell they would be almost certain to be broken and devoured. Having broken an egg, they would, after doing so, attack all that they could find with increased determination, and would not fail to break those with thick shells. When a pen of fowls has contracted this habit, the male bird is usually the greatest culprit, and will wait for the egg by a hen all the time that she is on the nest to lay.

Eggs become broken chiefly through their being thin-shelled or accidentally, and everything should be done to prevent these causes. It has already been pointed out that a deficiency of shell-forming material and an over-fat condition of the hen are the chief causes of the eggs having thin shells, and being consequently very liable to become broken; therefore, in a great measure, prevention lies in supplying an abundance of shell-forming material for the fowls when they are laying, or about to lay, and also in feeding with a diet not likely to cause them to become very fat. In order to prevent eggs becoming accidentally broken, it is necessary to keep the floor of the hen-house covered with some soft material, and especially under the perches. For this

purpose a thick layer of sand is very suitable, and besides tending to prevent any eggs becoming broken, the sand, if very dry and clean, which, of course, it should be, would act as a deodorant and keep the hen-house sweet for one or two months without the sand being changed. Sand would also keep the fowls much more comfortable than they would be on a hard floor. Some persons suppose that sand harbours the parasites that infest fowls, but just the reverse is the case if a little kerosene oil or Phenyle is occasionally sprinkled amongst the sand, for that would destroy them.

Placing the nests for laying in a rather dark corner of the fowl-house or making the house in such a way that it can be darkened during the day, tends to prevent egg-eating, and doing so is also an inducement for the fowls to lay in the nest instead of dropping their eggs about the run, for "Biddy" prefers a secluded place to lay in, and would go to one when she would not trouble to go to a nest in an exposed position. It is an error to place the nests in any position where the eggs can easily be seen, and especially when they are within easy reach of fowls which are not laying. If at all convenient, it is an advantage for the nest to be upon the ground. When the eggs are being eaten, it is not an easy matter to detect the culprit and stop the practice by killing the guilty fowl; and when this cannot be done, it is not an easy matter to stop the practice in other ways, but the following remedial measures may be adopted with considerable hope of success. In the first place, hard dummy eggs should be scattered about the run, and placed in the

nests, and they should be kept bright and clean so as to be nearly like natural ones as it is possible for them to be. Keeping these dummy eggs about, besides tending to stop egg-eating, is one of the very best means of prevention. To stop the practice, take a few eggs, make a small hole in the side of each, empty them, place the yolks and white in a plate, add a lot of strong mustard and a good quantity of pure Phenyle, mix well. Fill the egg shells with this mixture, and clean up the shells so that none of the stuff will be on them. Close up the holes with gum and paper. Place these filled eggs in the house near the nest, in the nest, and near the door. The egg-eaters will run to these and take a few good mouthfuls, but that will be enough for them; they will learn a lesson and leave the eggs alone. This performance must be repeated for a few days before the birds are cured of the wicked habit of eating eggs. If, after such treatment, the fowls are not cured of the vice, then some sort of trap-nest must be devised, by which means the eggs will be removed from the nests as soon as they are laid. If this cannot be done, then the birds guilty of the vice must be removed from the pen and killed.

12. A CURE FOR FEATHER-PULLING.—Feather-pulling is the result of idleness. Fowls that are well fed and confined, and which have no inducement to scratch, seem to learn the vice. One hen may happen to pull a feather from another by way of diversion. The sweet taste of the blood is satisfactory, and as the hen finds that it can have an unlimited supply from the other members of the flock, she puts her

resolution into practice. Other hens learn from her and soon the entire flock is ruined. If one of these hens is put in with another flock, she teaches them the vice. If one buys such a fowl, there is a liability of bringing the vice into the flock. A feather-pulling flock is almost worthless because it requires more food to produce more feathers, and the supply of eggs falls off correspondingly.

If the hens are very valuable and contract this vice, they may be cured by patient attention. Unfortunately the vice is usually contracted by valuable hens that are confined in pens.

The way to cure a hen of the habit is to cut off, with a sharp knife, the horny edge of the mandibles (r upper and lower part of the beak. By carefully cutting this off, at the same time cutting off the sharp end of the upper beak, there will be wedge-shaped opening between the two halves of the beak when the mouth is closed. This prevents them from getting a hold on a feather firm enough to enable them to pull it out. Cutting this horny edge off the beak does not hurt any more than cutting one's finger nails, and it will grow out again in a few weeks, by which time the vice is usually forgotten.

13. PROMOTING MOULTING.—The earlier the birds are out of their moult and in full plumage, the sooner they will begin to lay in the autumn. The pullets usually begin to lay as soon as they are completely plumed and become adult fowls. It is worth while, therefore, to encourage moulting in every way—giving them exercise, insect food or meat in

their rations, with ground bone or oyster shell and sound grain. Sunflower seeds, or linseed meal in their food, promotes moulting. A teaspoonful of fine salt in the soft foods given daily to a flock of twenty hens should be allowed.

The editor of *Poultry* uses the same arguments as we do as to the desirability of removing the cock birds from the hens. He writes :—

I have always found it beneficial to separate the sexes during the time of moulting ; and until the fowls are required for the breeding-pen, it is advisable to keep them parted. By adopting such a plan the male birds are rendered more vigorous by the early part of next season : and, moreover, it has the effect of causing the plumage of the females to remain in sound condition throughout the winter.

Although, as I have shown, it is possible to induce a moult, the process cannot be materially hastened by the poultry-keeper. All that should be done is to keep the birds warm and well fed. But as stimulating food causes fever, and thus prevents the formation of feathers, the diet should be of a cooling nature.

As to suitable food, the following will answer : Oats and wheat together in equal quantities ; peas and beans ; lean meat ; fresh raw bones cut or well broken ; ground oats and fine sharps, or ground wheat mixed with skim milk ; all are good. Where fowls are kept in close confinement it will be found very beneficial to give them lettuce that has gone to seed and is stalky, sods of growing grass, and heaps of fresh mould. Such foods as maize, rice or their equivalents,

and, above all, hemp seed, should be strictly excluded from the diet.

When the weather is bright, a small quantity of sulphur (about a teaspoonful to a quart of soft food) may be sprinkled in the morning meal; and heaps of coal ashes thrown into the bird's haunts are greatly relished. Warmth and dryness are the great things to observe; and avoid letting the birds catch cold. The well-known Douglas's Mixture may be given to the fowls if a tonic is needed.

The following advice given by Mr. H. deCourcy in *Farm and Garden* may well be considered:—Early moulting is desirable, he writes, in order that the hen may get through this critical period of her life while the weather is warm, and may be ready to devote all her energies to autumn and winter laying. Accordingly, those sections of experiment, reports relating to several moulting trials which have been made are of special interest and very great value to poultry-keepers. It is very seldom that a hen continues to lay during her moult, and it is undesirable also that she should do so, for all her energies ought now to be devoted to the casting off the old covering and the assumption of a new coat to do duty for another year of hard work. Moulting ought to take place in late summer or early autumn, and the earlier the better; and it may be brought about by a special course of feeding and general treatment, which seems to have been discovered and first made public by Mr. H. van Dresser, a practical breeder of farm poultry. The system recommended by him was to starve the birds for several days, giving them only as much

food as would keep them alive, and thus to stop laying and reduce weight; then to feed liberally on foods calculated to promote the growth of feathers. The "van Dresser" method, as it is known, was taken up by the West Virginia Experiment Station, with the object of putting it through a series of thorough tests, the fowls used being White Leghorns and Rhode Island Reds. The trials commenced on 5th August of last year, and all food was withheld from the birds for a period of thirteen days, except what they could pick up off the pastures of yards one hundred feet long and fifteen feet wide. After seven days of starvation treatment the hens ceased laying entirely and at the end of thirteen days they were again fed liberally on mash, beef scraps, maize, wheat and oats. After thirty days the moult was completed, and every hen had an entirely new coat. From this time it only took a week until many of the hens were in full lay, and half the flock or more was laying within a fortnight. For the purpose of comparison other hens were fed regularly all the time, and they continued laying spasmodically, and did not begin to moult until the hens which had been starved had completely moulted and were again in full lay. The results of this experiment are fully confirmed by the report of the Canada Central Experiment Station, where Professor A. G. Gilbert had the allowance of laying hens reduced by one half for the first three weeks in July with the result that laying was soon stopped and moulting begun, and by the middle of September the hens had assumed complete coats of new feathers and were laying steadily. The hens did not begin

to cast their feathers until liberal feeding was resumed towards the end of July. There is no reason to doubt that the methods reported may be applied in this country with equally good results, and if properly carried out the system should help the solution of the winter egg problem ; for the great advantage of securing an early moult is that the hens are in excellent condition to begin laying just when eggs are beginning to get scarce.

RECIPES.

1. **TONIC POULTRY POWDER.**—To be given during the rains and cold weather only ; not in the hot weather—

Charcoal	..	..	.. five seers.
Black Salt	..	..	.. half a seer.
Linseed	..	..	.. five seers.
Hempseed	..	..	.. one seer.
Cayenne Pepper	..	..	.. half a seer.
Turmeric	..	..	.. two seers.
Camphor	..	..	.. quarter seer.
Chiretta	..	..	.. half a seer.
Ginger	..	..	.. one seer.
Sulphate of Iron	..	..	.. two chittacks.
Sulphur	..	..	.. one seer.

Each ingredient to be finely ground separately, and then all to be thoroughly mixed together.

A quarter of a teaspoonful to be given to each fowl, every morning, in small pills or in the food. Give for a week and then stop for a week.

During the hot weather give the following:—

Charcoal	..	..	.. five seers.
Black Salt	..	..	.. $\frac{1}{2}$ seer.
Camphor	..	..	.. $\frac{1}{4}$ "
Chiretta	..	..	.. $\frac{1}{4}$ "
Sulphate of Iron	..	..	.. $\frac{1}{2}$ "
Sulphur	..	..	.. $\frac{1}{2}$ "
Treacle	..	..	.. three seers.

Grind finely and mix together thoroughly. Give half teaspoonful to a fowl every morning for a week or so and then stop for two weeks or more.

2. TONIC MIXTURE.—For weak leg and debility:—

Sulphate of Iron	..	..	16 grains.
Strychnine	..	..	$\frac{1}{2}$ grain.
Phosphate of Lime	..	..	80 grains.
Sulphate of Quinine	..	..	8 „
Tincture of Gentian	..	..	2 drams.

To be made into 32 doses. One to be given every day.

3. QUININE MIXTURE.—For simple colds and fever.

Quinine	..	..	$\frac{1}{2}$ grain.
Sulph. Acid (dil.)	..	..	one drop.
Tincture of Steel	..	..	one drop.

To be given once a day in half an ounce of water.

4. DOUGLAS'S MIXTURE.

Sulphate of Iron	..	..	quarter of a pound.
Sulph. Acid (dil.)	..	..	quarter of an ounce.
Water	..	..	one quart.

One ounce of this mixture to be given to every half gallon of drinking-water.

5. ROUGH ON LICE.—Have some fresh cowdung made into cakes and dried in the sun. Do not allow any straw or wood to be mixed with the cowdung. When the cakes are properly dried, have them burned. When the ashes are still black, before they become white, have them removed from the fire and kept on one side. No water must be put on the ashes. When cool, the ashes must be sifted through a fine flour sieve.

Take some fresh strong tobacco leaves. The country tobacco the people call *balati* is the best. Dry in the sun and pound into powder ; pass through a fine flour sieve.

Take two seers of the prepared cowdung ashes ; add one and half chittack or 3 ounces of pure Phenyle to it ; mix and rub the whole thoroughly until the Phenyle is properly mixed up with the ashes. To this add one seer of the prepared tobacco ; mix properly until the ashes and tobacco are thoroughly mixed together. To this add half a pound of flower of Sulphur ; mix properly.

When prepared, put into bottles or tins and cork tightly until wanted for use. This powder should be applied to all parts of a fowl affected with lice.

When needed for chickens, only half the quantity of Phenyle and tobacco should be used.

Another way of making insect powder :—Take 6 lbs. of finely sifted coal ashes, one lb. of flower of Sulphur, four ounces of Petroleum and four ounces of Phenyle. Mix the ashes and Sulphur together, and mix the Petroleum and Phenyle together ; then mix the whole together thoroughly. For very small chickens, Keating's Insect Powder should be used.

When applying the powder to the bird, it should be held on a large sheet of paper or a sheet of tin, and as the lice fall on the paper, they should be destroyed by fire.

6. LICE LOTION.—(1) Napthaline one ounce, Methylated spirits one ounce, Cocoanut oil seven ounces. The following can be applied to large chickens and adult birds. (2) Kerosene oil two ounces, Phenyle one dram, Cocoanut oil

